

CIRCULAR  
BALEARS

TRANSITIONING  
TOWARDS A CIRCULAR  
TOURISM SYSTEM  
IN THE BALEARIC  
ISLANDS

Baseline assessment

 **impulsa**  
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 **CIRCLE**  
ECONOMY



## CIRCLE ECONOMY

As an impact organisation, Circle Economy connects and empowers a global community to create the conditions for systemic transformation.

With nature as a mentor, Circle Economy works alongside businesses, cities and governments to identify opportunities to make the transition to the circular economy and provides a powerful combination of practical and scalable solutions to turn these opportunities into reality.

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## IMPULSA BALEARS

Impulsa Balears is a strategic knowledge and regional interaction platform. As a private non-profit organisation, Impulsa Balears provides economic intelligence solutions to inspire the decision-making processes of local actors and to ensure a positive impact on the global competitiveness of the archipelago.

Looking for a prosperous and regenerative future, Impulsa Balears is currently deploying an ambitious set of projects to foster the circular transition in Balearic Islands.

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### Shifting from a linear to a circular economy

In today's linear economy, material use goes hand in hand with prosperity; globally, we extract more than 100 billion tonnes of materials each year, only 7.2% of which are cycled back into the economy.<sup>1</sup> Our already enormous demand for raw materials is continuing to rise as incomes and populations grow worldwide. Our supply of raw materials is finite, however: our linear system is thus leading to resource scarcity and price volatility. The circular economy closes resource cycles and preserves value as much as possible for as long as possible to provide an alternative to our take-make-waste system and provide new avenues for economic development.

Material extraction, processing, use and disposal is responsible for 70% of global emissions.<sup>2</sup> Lowering greenhouse gas (GHG) emissions is therefore inextricably tied to cutting material use. By using fewer materials, using materials for longer, using clean, regenerative materials and using materials again once they've reached the end of their functional lifetime, the circular economy provides a means for reducing both material use and emissions. Benefits aren't just environmental: a circular economy can create new opportunities for value creation, boost competitiveness and generate jobs.<sup>3</sup>

### Regions are crucial to the transition

Regions have the power to drive the transition to a circular economy. They have the responsibility of providing goods and services, while fulfilling societal needs such as healthcare or mobility. As such, they often have the ability to develop their own policies and strategic priorities based on their economic and social contexts. This is a result of their ability to influence and shape economic systems, and to address social, and environmental problems through policy making. In many cases, regions have legal and regulatory authority to direct funding and advance innovation. In this sense, circular regions are an essential part of the global shift towards a circular economy.<sup>4</sup>

### The tourism system and the circular economy

The tourism system is an integrated whole of entities, natural resources, cultural assets, and social and economic activities—all deeply connected among themselves—organised to embrace the phenomenon of tourism and, at the same time, to benefit from it, both in economic and social terms. Some of these benefits are frequently recognised in the literature, such as job creation, local economy strengthening, poverty and inequality reduction and natural and cultural conservation.<sup>5,6</sup>

In the Balearic Islands, after over 60 years of tourism development, the tourism system has become central to people's lives and is a key element for equitable and sustainable development, in the face of local and global environmental and economic impacts. This emphasises the role of the tourism system in building long-term environmental resilience and in developing an effective economic value proposition that will enable the region to thrive. Even more, when the Balearic Islands are facing an important challenge in promoting sustainable global competitiveness compared with other EU-27 regions, especially in terms of efficiency and innovation.<sup>7</sup> This explains the negative differential with respect to average European productivity and, therefore, the progressive erosion of per capita income since the 2000s.<sup>8</sup>

The transition to a circular tourism system offers the region an opportunity to boost efficiency and innovation, and progress towards prosperity in the long-term. The region's role as a leader in tourism<sup>9</sup> can be leveraged to implement circular solutions, support other tourist regions, and ultimately build resilience to climate change. Additionally, the commitment to a circular economy allows the region to align with the EU-level *Circular Economy Action Plan*,<sup>10</sup> as well as national strategies, such as the *Spanish Circular Economy Strategy (España Circular 2030)*,<sup>11</sup> the *Spanish Urban Agenda*<sup>12</sup> and the *Green Public Procurement Plan*.<sup>13</sup>

At the regional level, the Balearic Islands have already started implementing policies such as the Waste and Contaminated Soils Law (Ley de residuos y suelos contaminados)<sup>14</sup> the Climate Change and Energy Transition Law (Ley de cambio climático y transición energética)<sup>15</sup> and the Tourism Law (Ley de medidas urgentes para la sostenibilidad y circularidad del turismo),<sup>16</sup> which include circular economy principles. Some initiatives have been developed to support the conservation and sustainable management and use of natural resources, including forests, oceans, coastal areas and other ecosystems, for their provision of ecosystem services.

Circular initiatives and good practices have emerged over the last few years, creating momentum in the region. However, the circular economy is still in its infancy: an overarching vision and strategy that brings the circular economy to the centre of the region's tourism system is still lacking.

To capitalise on this momentum, Impulsa Balears launched the 'reN · Movement for a regenerative future of the Balearic Islands'<sup>17</sup> in 2021, in order to accelerate the transition to a circular tourism system. The initiative provides support for comprehensive strategies, identifies gaps, selects appropriate key focus areas for action and promotes open dialogue between public and private stakeholders.

Successfully transitioning to a circular tourism system will require stronger partnerships between government, the private sector, civil society, trade unions and employers' organisations, multilateral and regional organisations, academia and other relevant stakeholders. All stakeholders have a role to play in designing, implementing, monitoring and evaluating circular strategies.

There is a clear opportunity to shape a new, collaborative regional vision for the future, and to define new strategies with a long-lasting impact on the Balearic Islands' economy, environment and society. It's time to accelerate the transition towards a circular tourism system that can offer new forms of value creation and prosperity for the region.

### The beginning of a collaborative journey

This project will uncover key opportunities for the Balearic Islands' tourism system to transition to a circular economy. Led by **Circle Economy** and **Impulsa Balears**, this project takes a collaborative, multi-stakeholder approach to facilitate collaboration and guide the region towards circularity.

This report specifically highlights circular opportunities for the key focus areas of Water, Energy, Food, Materials and Mobility in the tourism system. These opportunities build on already existing local circular initiatives, and consider their impact and influence on terrestrial and marine environments, but also how the latter can be managed to facilitate the circular transition. An assessment was conducted by using the following steps:

- 1. Mapping the tourism system:** Understanding the tourism system in the region by outlining relevant stakeholders and active circular initiatives.
- 2. Baseline assessment and gap analysis:** Developing a baseline measurement of circularity in order to identify the main gaps and challenges to be addressed, and defining circular economy opportunities that can allow the transition to a circular tourism system.
- 3. Development of strategic directions:** Defining strategic directions that can guide the transition to a circular economy in the tourism system, based on the insights and opportunities identified and prioritised through the support of the local stakeholders.

### Key Focus areas

In a linear economy, tourism activities consume resources and emit pollutants into the environment. Key activities, such as water and energy services, agrifood, and construction and manufacturing also use and impact natural resources and ecosystem services. The main resources consumed are water, energy, food, and materials. What's more, tourism requires services such as mobility, as well as ecosystemic services from terrestrial and marine ecosystems.<sup>18</sup>



#### Water

The Balearic tourism system is highly dependent on freshwater. The pollution and misuse of water in circulation breaks the resource's natural cycle, which ultimately increases water stress in the region. The shift towards a circular tourism system may focus on optimising water consumption, making it more efficient, and increasing its high-value reuse. This will entail better managing and treating water flows that derive from the wastewater collection and treatment processes, but also from a more efficient distribution and consumption of the resource in the first place.



#### Energy

The Balearic tourism system uses fossil fuels for the generation, distribution and consumption of energy. This makes it highly dependent on other regions, while also making it an emissions-intensive system. The transition towards a circular tourism system may take advantage of the region's natural resources to generate renewable energy, ensure a steady supply and develop practices that increase efficient consumption.



#### Materials

The Balearic tourism system consumes a large volume of materials. Optimal use and end-of-life recovery are not ensured, so waste generation is prevalent. The transition toward a circular tourism system may focus on increasing the efficiency of material use and management, by increasing material productivity, reducing the extraction and consumption of virgin materials, and optimising the closure of material flows.



#### Food

The Balearic tourism system is an important food consumer, which is dependent on a supply chain with limited capacity for self-supply and low efficiency. The regional food supply chain depends significantly on imports, and generates large volumes of waste

throughout various production, distribution and consumption processes. The transition towards a circular tourism system may focus on increasing the efficiency of resources allocated to agricultural and livestock production, and developing sustainable agricultural practices in favour of food self-sufficiency. It will also involve a shift in consumption habits, and distribution and packaging mechanisms that minimise value loss and food waste.



#### Mobility

The Balearic tourism system requires mobility to move people and goods from A to B. Mobility systems use infrastructure and vehicles, which generate significant volumes of waste and are responsible for a large part of the region's GHG emissions. The transition to a circular tourism system would require a reconfiguration of the current transport network, improving its efficiency and increasing the life cycle of its main components (such as vehicles and infrastructure). To do so, the Balearic Islands must provide multimodal, automated, clean and affordable mobility both to connect actors within the system and to cover their travel and logistics needs.



#### Terrestrial and marine environment

The Balearic tourism system depends on and benefits from the services provided by the islands' ecosystems. While infrastructure services are also central to the functioning of the tourism system, the system requires an appropriate territorial and urban planning, where the functionality of the environment is considered in the development of new infrastructure and equipment. The transition toward a circular tourism system may focus on putting new territorial management guidelines into practice that consider land use (for agriculture, forestry and the built environment, for example). These guidelines may also create synergies with other agendas, such as blue or bio economies, to define the productive use of land and sea resources.

1

# UNDERSTANDING THE TOURISM SYSTEM IN THE BALEARIC ISLANDS



Before proposing solutions, it's necessary to understand which elements make up the Balearic Islands' tourism system—and how it is performing in relation to circularity.

## Stakeholder mapping and current state of circularity implementation

The first step: mapping the tourism system's local stakeholders to understand the role they have—or will have in the future—in developing a circular economy. Secondly, we investigated existing circular economy initiatives on the islands to understand where the transition is already taking shape. Thirdly, we engaged with the local stakeholders, via surveys and a workshop, to capture the level of understanding of the circular economy and identify the main challenges and opportunities they see for the circular transition in the tourism system.

## THE BALEARIC ISLANDS AT A GLANCE

The Balearic Islands are one of Spain's 17 autonomous communities. The autonomous communities have a certain degree of financial and political independence, meaning that they can approve laws at a regional level.<sup>19</sup> The four islands—Mallorca, Menorca, Ibiza and Formentera—also have their own councils that act as local governments.

The Balearic Islands are also one of the most attractive tourist destinations in Spain. Thus, the islands have a predominantly floating population: people living temporarily in a given place who are not part of the census of the population. As a matter of fact, in 2019, human pressure on the archipelago exceeded between 2.3% and 72.7%, the population registered on the islands depending on the month of the year.<sup>20,21</sup>

In 2019, the Balearic Islands' GDP was €33,935 million, positioning them as number 11 of 17 in the ranking of the annual GDP of autonomous communities.<sup>22</sup> However, per capita GDP positions the islands 6th out of 17. Tourism contributes significantly to the economy and employment: tourism's GDP was €12,577 million, representing 40.9% of the region's total GDP.<sup>23</sup> In 2019, 146,375<sup>24</sup> people were employed in tourism activities such as

accommodation, food services, leisure and culture<sup>25</sup>—although indirect employment across the entire tourism system is expected to be much higher.

The Balearic Islands are made up of forests, agricultural land and the built environment, and of course are surrounded by sea. As the islands' natural and cultural resources make them a hub for tourism destinations, preserving their biodiversity and other ecosystem services will be essential to maintaining the tourism system. This can be done through a circular economy, which allows for sustainable and inclusive socioeconomic development and ensures that ecosystems are regenerated.

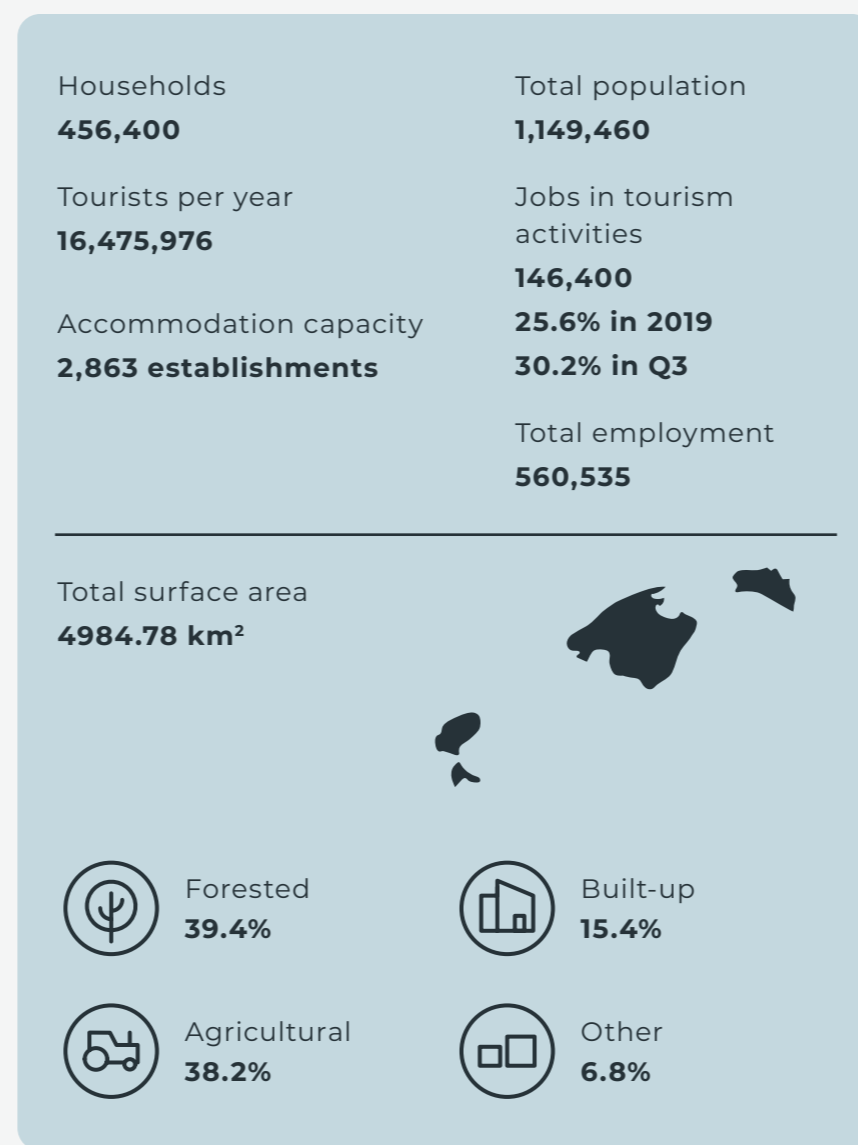


Figure one shows the Balearic Islands at a glance.<sup>26,27,28,29,30,31,32,33</sup>

## THE TOURISM SYSTEM: BEYOND ACCOMMODATION, FOOD SERVICES, AND LEISURE AND CULTURE

### The scope of the tourism system

From a circular economy perspective, the tourism system consists of a complex nexus of interlinked elements and actors. Economic activities—which connect tourism activities with the necessary supply and treatment of physical resources, as well as administrative activities—interact with each other, and at the same time, they establish strong interlinkages with the social, political, technological and ecological environments.

Over the past six decades, the Balearic tourism system has proven to be flexible enough to adapt to new local and global needs and contexts, ensuring that individuals, businesses, institutions, and the region as a whole can better react and recover from stresses and shocks.<sup>34</sup>

Impulsa Balears believes that transitioning to a circular tourism system will promote an economic transformation, creating new forms of value, increasing productive capacity and improving competitiveness, and fostering the development of sustainable business models. This includes the promotion of sustainable and regenerative consumption and production patterns, resource efficiency, and the shift to a low-emission and climate-resilient economic system.

The tourism system's circular transition must be led by both the public and private sectors, promoting the mobilisation of resources for the development of priority areas with significant transformation potential. This will include the development of new business models that close material loops, and the implementation of integrated water resource management, clean energy systems, regenerative food production, sustainable mobility and resource efficiency in the terrestrial and marine environments.

# 1 UNDERSTANDING THE TOURISM SYSTEM IN THE BALEARIC ISLANDS

Figure two shows the tourism system from a circular perspective. It includes the different parts of the system (tourism supply chain, support activities and services, society and environment), the different stakeholders that are part of it, how they interact with each other, and the resources and materials they exchange in order to operate.

- **Tourism activities** are the activities that consume and dispose of the resources that flow throughout the system. These include accommodation, food services, leisure and culture, retail and transport.
- **Supply and treatment of resources** are the activities that supply the resources such as water, energy, food and materials for tourism activities. Activities that manage the reuse or disposal of resources at the end of the value chain and during the use phase are also included under this term. These include maintenance, repair and renovation, demolition and waste treatment and sanitation.
- **Support activities and services** refer to the institutions and entities that offer regulation and planning services, financing, knowledge and technology for the tourism supply chain.
- **Society** includes human capital (in terms of skills and knowledge to operationalise different activities), consumption habits, and interactions between residents and tourists that contribute to the functioning of the system.
- **The environment** involves a bi-directional relationship with the tourism supply chain, because it provides the system with vital ecosystemic services (like natural assets and land), while being impacted by emissions, waste and pollution.

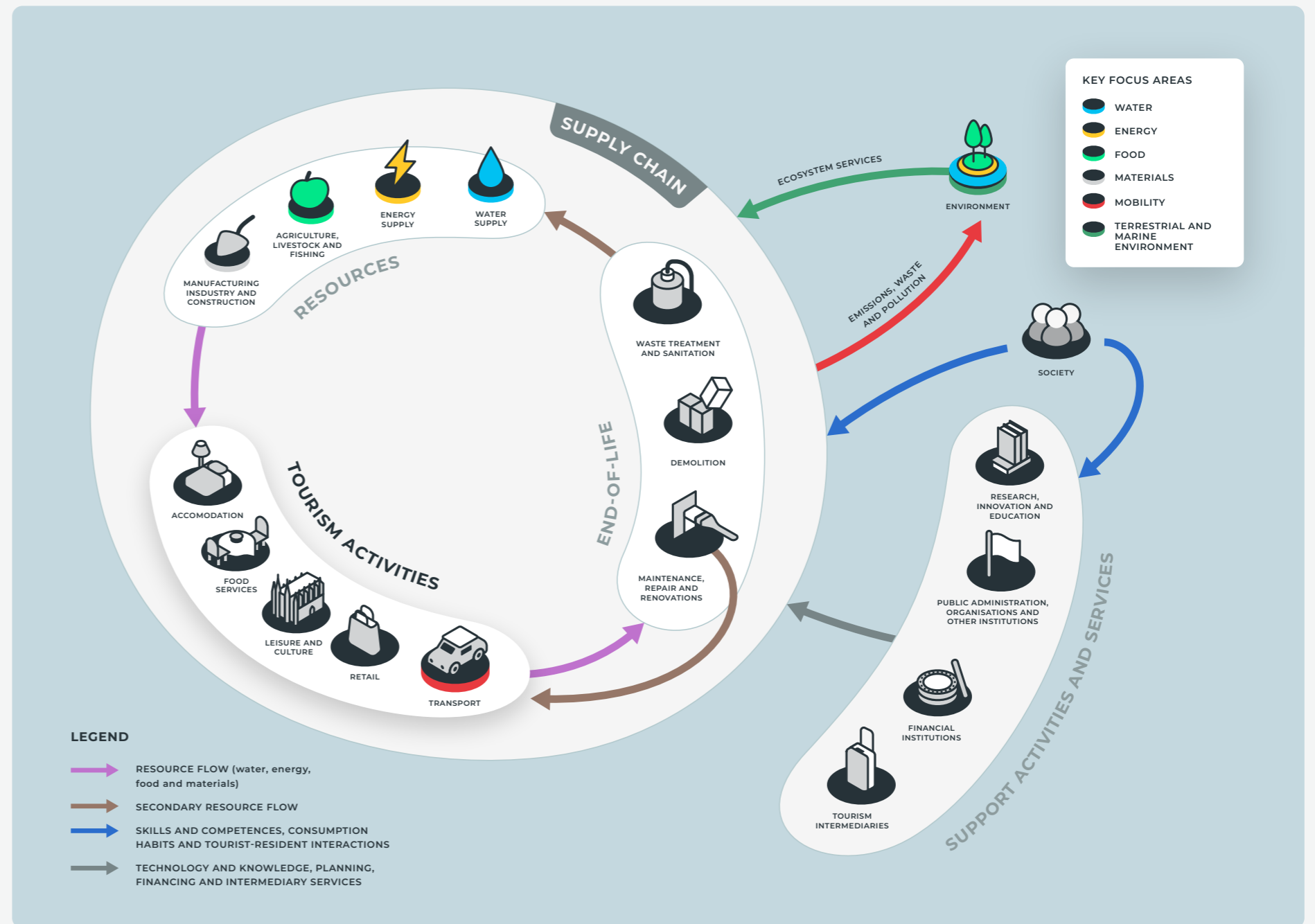


Figure two shows the tourism system in the Balearic Islands.

# 1 UNDERSTANDING THE TOURISM SYSTEM IN THE BALEARIC ISLANDS

## STAKEHOLDERS IN THE BALEARIC ISLANDS' TOURISM SYSTEM

The shift to a circular tourism system requires stakeholders to adapt or alter their roles and responsibilities. In the Balearic Islands' tourism system, numerous stakeholders are active, each with their own distinct and interconnected functions and interests.

The 165 stakeholders mapped were categorised by three activity types: tourism activities, supply and treatment of resources, and support activities and services.

Figure three shows the number of stakeholders in each segment of the tourism system. It is important to consider that the quantity of stakeholders does not necessarily reflect the importance and economic impact of a given activity. This analysis provides insight into the concentration or fragmentation, which may have an impact on the management strategy for local stakeholders in the adaptation or modification of their responsibilities throughout the transition towards circularity.

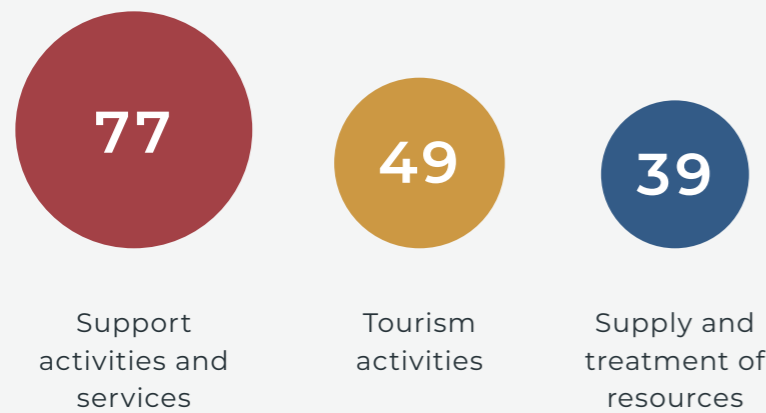


Figure three shows the number of stakeholders mapped in the different tourism system activities.

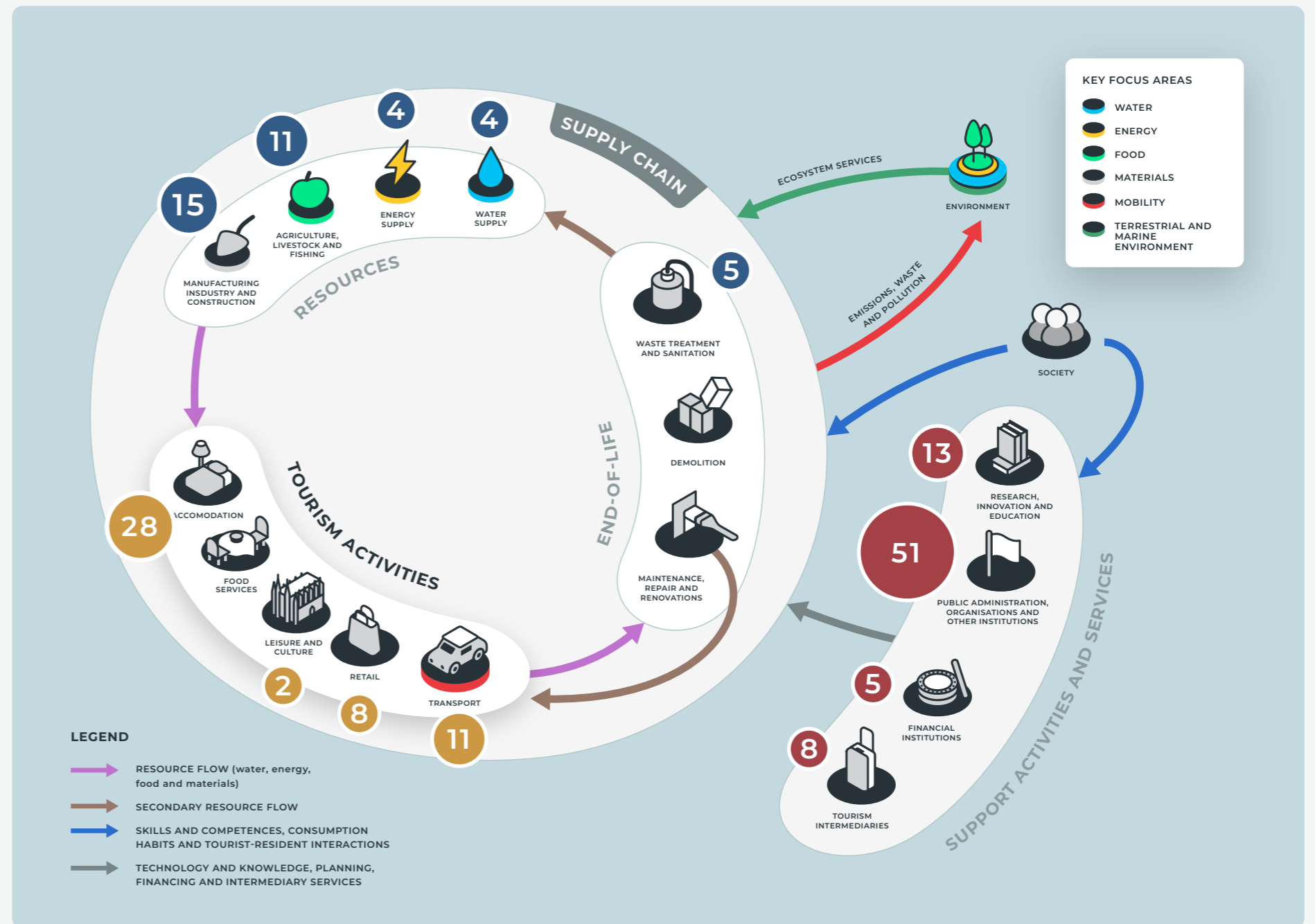


Figure four displays the number of stakeholders in each element of the tourism system.

### Stakeholders in tourism activities

These stakeholders are part of the accommodation, food services, leisure & culture, retail and transport activities. The **role** of these actors is to facilitate the tourism experience. Nonetheless, in a **circular economy**, they have a very important role in maintaining the value of the resources for as long as possible, and ensuring regenerative practices are prioritised.

As seen in Figure four, the stakeholders in the tourism activities are **fragmented**: there are multiple accommodation industries, food services, and transport companies. **Collaboration** among stakeholders will be crucial in order to create systemic change, generate impact, enable flexibility, and anticipate the problems that can arise in the transition towards a circular system.

### Stakeholders in the supply and treatment of resources

Water, energy, food and material supply companies are essential actors in the tourism system. These entities have the **role** of providing key resources that enable tourism stakeholders to operate and supply tourism activities. In a **circular economy**, these actors should be in charge of mitigating the environmental impacts of their products and resources, but also incorporating an extended producer responsibility.

The stakeholders at the end of life phases, such as waste treatment and sanitation, repair and renovation, and demolition companies have the **responsibility** of collecting and treating resources after use. Currently, in the islands, most of these resources end up incinerated or landfilled. According to the Ministry of Ecological Transition, 56.1% of the waste generated on the islands was incinerated and 21% was taken to landfills in 2019.<sup>35</sup> To transition towards a **circular economy**, these activities should shift towards waste prevention, and the recovery, reuse and recycling of secondary materials. These actors have the added responsibility of ensuring that resources are not downcycled and make efforts to ensure the increased value of the streams.

Figure four shows that water, energy, and the treatment and sanitation of residues are more **centralised**. Few companies are in charge of the distribution and regulation of these services. On the other hand, the supply of food and materials is more **fragmented**. Both centralised and decentralised supply chains have benefits, a more centralised supply chain allows for efficiency and visibility, and a decentralised supply chain allows for flexibility and fast solutions for specific issues.<sup>36</sup>

**Collaboration** throughout the supply chain is thought to be essential for enlisting important stakeholders to support projects, improve communication, and deepen knowledge. It is required for innovation, reverse logistics, and value preservation. All businesses can use collaboration as a strategy to help them grow.<sup>37</sup>

### Stakeholders in institutions and support services

Most of the stakeholders mapped are working on providing administrative, technological, regulatory and financial support to the tourism supply chain.

The first group of stakeholders are members of public administration, organisations and other institutions. Their **role** is to plan and regulate other entities' affairs in the system. In other words, they develop the rules that govern the tourism system. In a **circular economy**, these regulations create the playing field for stakeholders and market to stimulate innovation towards a circular economy. The policies can remove barriers, foster collaboration, and align circular activities.

Research, innovation and education entities have the **role** of providing knowledge, skills and technology to the system. In a circular economy, the transition requires upskilling and reskilling workers, as well as innovating technologies or business models. Not to mention, there is a need to educate the general population.

Financial institutions are banks, investors, and shareholders that provide financial support to the tourism supply chain. To enable a **circular economy**, the financial instruments need to be adapted to the market needs. To do so, these entities are responsible for incorporating new financing models like crowdfunding and value assessments that can facilitate the development of circular business models. Additionally, they can incorporate financial schemes externalities into the risk assessment of linear activities.

Tourism intermediaries have the **role** of providing assistance for the operation of tourism activities. To create a **circular economy**, these intermediaries should promote circular tourism activities and services and could use digital technologies to help make the system more effective, and interconnected among the supply chain.

In general terms, the stakeholders in the institutions and support services are **fragmented**, this can be observed in Figure four, especially when considering the institutions, organisations, clusters, and other entities. This means that regulation, policy-making and supporting activities of the tourism system are not relying on only a few actors. The fragmentation could present a challenge for the **collaboration** of these stakeholders since more needs and opinions are involved. In a circular economy, collaboration would enable the alignment of regulations, with financing, and technology which is an essential part of the transition.

# 1 UNDERSTANDING THE TOURISM SYSTEM IN THE BALEARIC ISLANDS

## CIRCULAR INITIATIVES IN THE BALEARIC ISLANDS' TOURISM SYSTEM

Determining the current level of circularity requires taking a close look at the circular initiatives on the islands. A long list of regional circular initiatives in the value chain was created through desk research and interviews with local stakeholders.

As can be seen in Figure five, a total of 108 initiatives were spotted, most taking place in Mallorca. Although Mallorca is the biggest island, there is an opportunity for the other islands to continue developing initiatives in the circular economy. 44 initiatives are regional, meaning that all the islands are included: this shows that there is an interest in aligning efforts across all islands.

The initiatives were mapped using the Eight key elements of the circular economy framework. The eight elements can be divided into two types: core and enabling. The core elements are prioritising regenerative resources, stretching the lifetime of a product, and using waste as a resource.



Of the core elements, **prioritising regenerative resources** has appeared in the majority of initiatives. These include the use of renewable energy sources both for electricity and heat, as well as for mobility. Clean Stone by Paviments Lloseta exemplifies one sustainable offering: tiles, pavements and walls made with recycled material, using reconstructed stone. The product is 100% recyclable and boasts a lower carbon footprint compared to conventional products.<sup>38</sup>



**Using waste as a resource** is the second most prevalent circular practice. Initiatives in this category relate to recycling and the recovery of nutrients and resources from waste. Thus, they are mostly linked to the key focus areas of Materials, Food and Water. However, in the Balearic Islands, recycling rates are low when compared to other autonomous communities in Spain (see Chapter two of the report). Although some initiatives to use waste as a resource exist, these should be expanded upon. One example is the initiative by Garden Hotels, Garden not Common, which aims to turn residues of organic waste into compost.<sup>39</sup>



The least-mentioned core element was **stretching the lifetime** of products. This element includes principles such as reuse, repair, remanufacturing, and refurbishing. Increasing these initiatives can preserve the value of the resources for longer. Fem que Circuli, an initiative by Fundació Deixalles, aims to promote the circular economy in the hospitality and real estate sectors through the repair and reuse of products such as furniture, while also promoting social and labour insertion of vulnerable groups.<sup>40</sup>

The enabling elements of the circular economy include rethinking the business model, teaming up to create joint value, designing for the future, incorporating digital technology, and strengthening and advancing knowledge. Rethinking business models and strengthening knowledge were among the least observed elements, while design for the future was the most prevalent element in the initiatives.

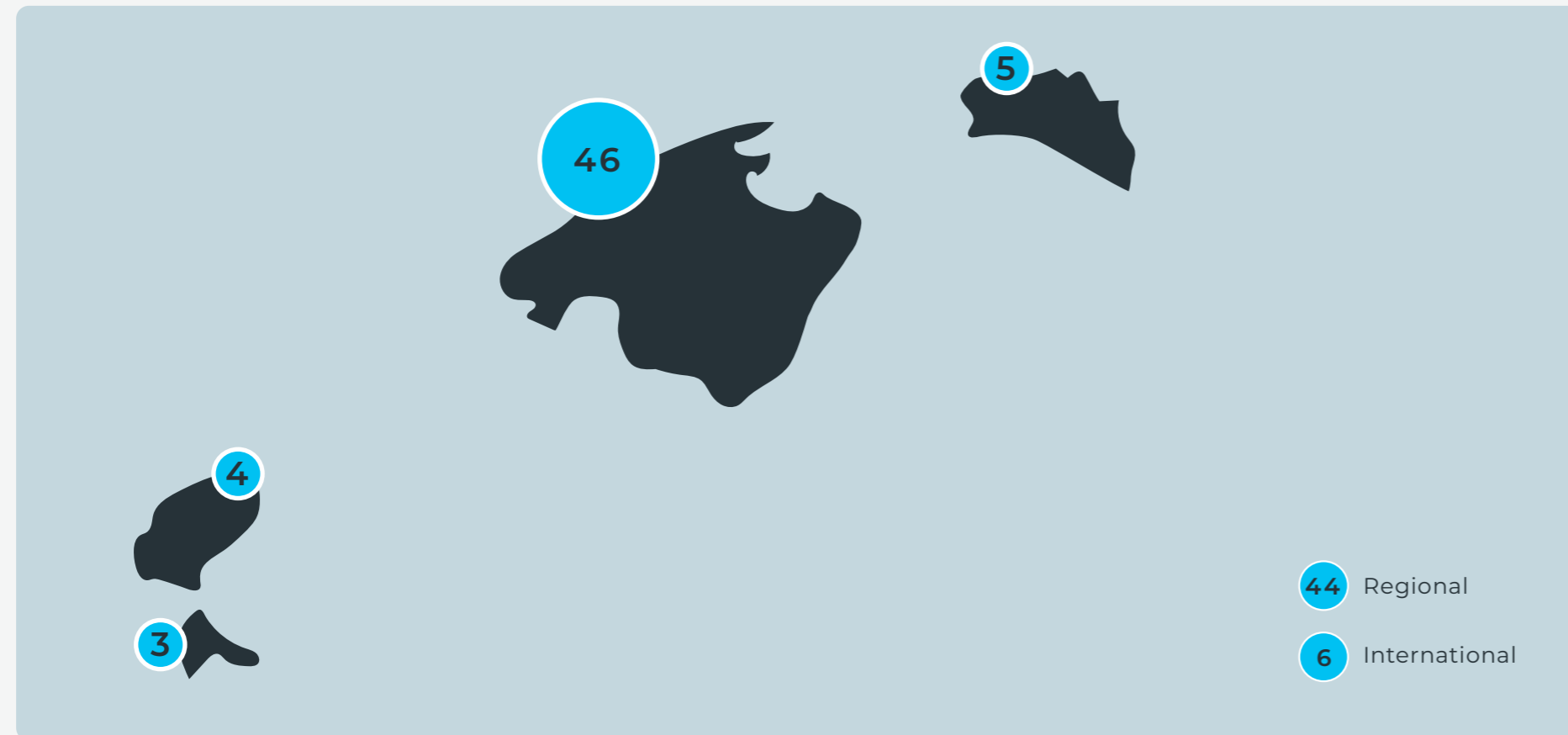


Figure five shows the number of circular initiatives across the different islands.

# 1 UNDERSTANDING THE TOURISM SYSTEM IN THE BALEARIC ISLANDS

**Rethinking the business model** centres on creating business opportunities that build on the interactions between products and services (such as the sale of durable long-lasting goods, Product-as-a-Service models, rental or peer-to-peer sharing). This element was observed in initiatives like Begudes Puig, a beverage company driving the sustainable transformation of soft drinks in Mallorca. It focuses on the sale of sustainably and locally produced soft drinks, contained in refillable glass bottles to eliminate the use of plastic bottles.<sup>41</sup> These initiatives highlight the potential for the Balearic Islands to create novel business models and interactions among stakeholders.

The **strengthen and advance knowledge** element aims to develop research and structure knowledge for the circular economy transition. There is a clear opportunity for the islands to push these initiatives to increase awareness among tourists and residents. Wave of Change, by Grupo Iberostar, aims to raise awareness and educate people about the importance of the sustainable and circular use of the sea and its coasts. With a special focus on the tourism sector, the organisation is taking action through communication and awareness campaigns.<sup>42</sup>

**Team up to create joint value** initiatives are necessary strategies to create symbiosis among stakeholders. For instance, the Finhava project, managed by TIRME (a waste management service company), connects stakeholders in the organic resources supply chain in order to prevent and divert waste from incineration and landfill.<sup>43</sup>

**Incorporate digital technology** initiatives are also gaining popularity. This element centres on using technology to track resources and strengthen connections between actors. For instance, Wireless DNA has developed a solution for monitoring Municipal Solid Waste (MSW) that provides real-time information on the weight of each container and waste.<sup>44</sup>

The most popular enabling element was **design for the future**. This includes projects that make a conscious effort to account for a system perspective and design with materials and elements needed to increase product lifetimes. One important initiative is LOOP Disseny i Circularitat, established by the Balearic Islands institute for business innovation (IDI), which aims to combine aesthetics, functionality and circularity by connecting designers and manufacturers that wish to prioritise the use of local materials and reuse waste.<sup>45</sup>

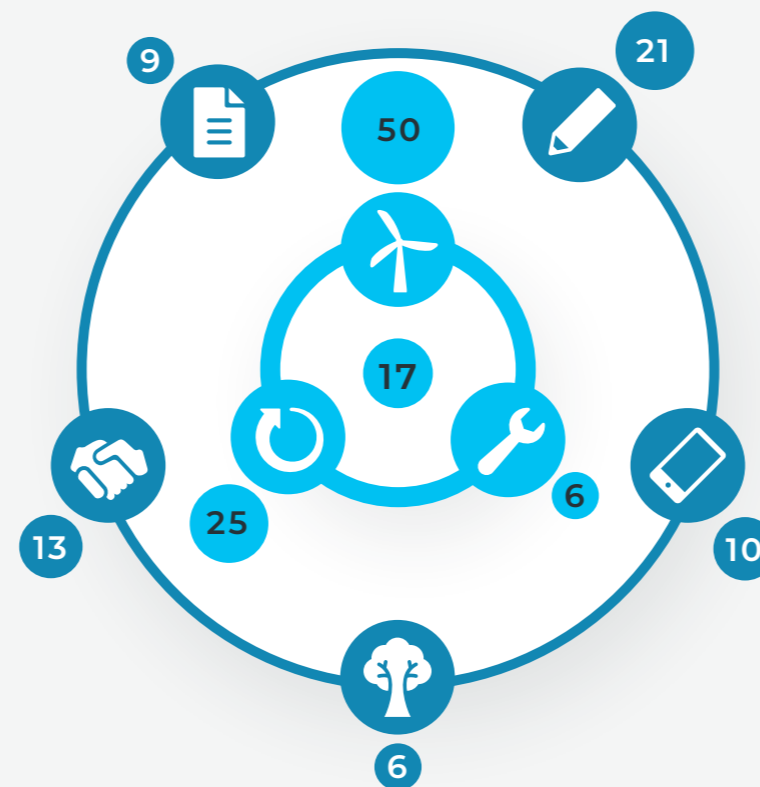


Figure six shows the initiatives in the Balearic Islands' tourism system across the key elements of the circular economy.<sup>46</sup>



## CHALLENGES FOR A CIRCULAR TOURISM SYSTEM

According to the local stakeholders, through the survey and the first workshop, the main challenges for the tourism system's circular transition are **consumption habits** and the **endowment of infrastructure** (Figure seven). These top challenges show that the region's transition will require combined action between the public sector, consumers and the private sector in order to shift consumption mindsets and to provide necessary infrastructure such as resource processing plants, reverse logistics infrastructure, and physical or digital marketplaces. The challenges that were least considered were **talent availability and access to financial resources**, which might indicate that the financial resources for the transition are available and that the workforce is ready to operate in a circular economy. Therefore, from these results, it is clear that the transition is possible if resources and efforts are well allocated.

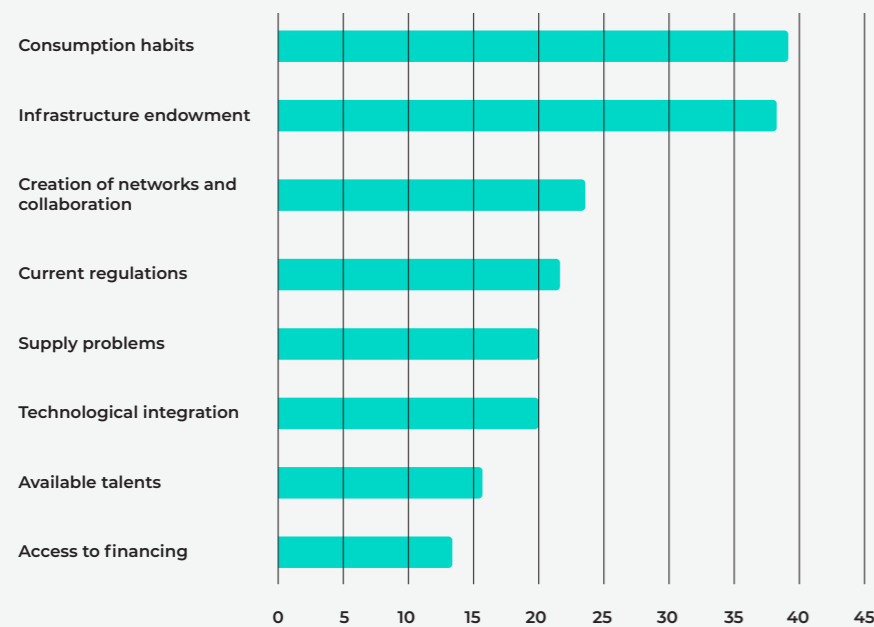


Figure seven highlights the main challenges for a circular tourism system, according to survey responses.

From the interactions with the stakeholders, additional insights were identified. The stakeholders provided their thoughts about the challenges in each of the key focus areas. With this information, the three most relevant types of challenges per key focus area were selected.

In general terms, five out of six key focus areas have consumption habits as one of the main challenges. Infrastructure endowment was found to be a challenge for four of them. Moreover, the stakeholders also identify current regulations as one of the main challenges for three out of the six. Descriptions of the identified challenges are listed in Table one.

TYPE OF CHALLENGE	WATER	ENERGY	FOOD	MATERIALS	MOBILITY	TERRESTRIAL AND MARINE ENVIRONMENT
<b>Consumption habits</b>	Negligent water use in industries and accommodations.		Lack of source separation and high rates of food disposal.	Overconsumption and need of ownership.	Excessive use of private vehicles.	Lack of awareness of natural resources as finite, consumption of products with high ecological footprints.
<b>Infrastructure endowment</b>		Need for infrastructure for storage capacity and an increase in renewable energy sources.	Not enough facilities that manage organic waste.	Not enough facilities that manage municipal solid waste. A lack of digital infrastructure for material traceability that can improve material management.	Need for better shared and greener mobility systems.	
<b>Creation of networks and collaboration</b>	Governmental public administration is not aligned with municipalities for wastewater management.			Current efforts for industrial symbiosis are scattered so creating and aligning networks presents a challenge.		
<b>Current regulation</b>	Administration poses barriers for the reuse and management of water.				Misalignment with infrastructure: for example, there is a legislative push for electric personal vehicles but there are not enough charging points in the cities.	There is a need to increase the protection of oceans, coasts and natural areas, for which regulations will be essential.
<b>Technology integration</b>		Technology is needed for energy storage, and for green hydrogen in electro-intensive industries.				
<b>Access to financing</b>		The current legislative push for renewable energy is not matched with the financing options available.	This is challenging for the agricultural sector in particular, since there is a lack of private and public investment in local and sustainable food production.			It is difficult to obtain funds to prevent, protect or regenerate areas with environmental degradation.

Table one outlines the types of challenges identified by stakeholders in each key focus area.

REMARKS FROM THE FIRST  
WORKSHOP

The first workshop of the tourism system scan process was held in Palma, capital of the Balearic Islands, on the 17th of November, 2022. Forty stakeholders representing the key focus areas attended the event. This was an opportunity to bring together key local stakeholders with the intention to start an open discussion and visioning exercise for the development of the circular economy in the region.

The workshop aimed to:

- Introduce stakeholders to the project and its goals;
- Present the main results of the first part of the project: Understanding the tourism system in the Balearic Islands;
- Engage in an interactive session to collect stakeholders' input regarding challenges, opportunities and the vision for transitioning towards a circular tourism system in the Balearic Islands.

## OUTCOMES OF THE FIRST WORKSHOP

The message was loud and clear: the Balearic Islands' tourism system has great potential to become more circular. First, there are many real-world examples of circular tourism already taking place. The conversations yielded insightful information, including: the need to align the circular strategies with the existing infrastructure and capacity. Efforts should be made to increase the self-sufficiency of the tourism system in terms of energy, materials and food. Finally, in a collaborative manner, the following transformational levers were determined: the improvement of consumption habits, the provision of infrastructure and the creation of symbiotic networks among stakeholders.



2

SETTING A  
BASELINE  
&  
UNDERSTANDING  
OPPORTUNITIES



The second phase of this project consisted of assessing the main gaps and challenges for the transition to a circular tourism system. This assessment helped derive baseline information across the key focus areas, allowing us to shape pursuable objectives in order to achieve a circular tourism system in the future.

This section provides insights on the methodology used to define a framework of circular indicators, and how these were used to size the current gap and prioritise circular opportunities. In this section, the baseline assessment and gap analysis are written in chapters per key focus area: Water, Energy, Materials, Food and Mobility.

A connection is also made between the key focus areas and the Terrestrial and marine environments. Not only can the circular transition contribute to minimising the negative impacts on the local environment, the spatial planning and management of the terrestrial and marine environment also plays a transversal role in the transition, as a mechanism to deploy solutions and leverage potential synergies to maximise the positive impact.

## OUR APPROACH

### Defining a framework of circular indicators

By creating a set of circular indicators, we can shape a comprehensive picture of the Balearic tourism system's resource metabolism. This allows us to measure the system's current state of circularity, monitor future progress and inform evidence-based decision-making. As such, a first effort consisted of defining the indicators that would provide a comprehensive understanding of the flow of materials and resources used for each of the key focus areas.

Water, Energy, Materials and Food can be directly assessed as flows of resources and materials, which is why indicators under these key focus areas were categorised into the following two groups:

- **Production and Consumption:** Indicators that capture the inflows of Water, Energy, Materials and Food; including the different sources of extraction, production or supply for each of these and how they are consumed.

- **Waste Generation and Treatment:** Indicators that capture the outflows and emissions of Water, Energy, Materials and Food, and allow us to track how these outflows are currently treated and managed at the end of the value chains.

In contrast, the key focus area Mobility does not relate directly to a physical resource that flows throughout the tourism system. Instead, Mobility is a complex and essential service for the operational performance of all the actors and sectors taking part in transportation that requires a source of energy, an infrastructure network and a logistics system. For the purpose of this project, we decided to explore indicators that would focus on the following:

- **Inter-territorial mobility:** Indicators that capture the magnitude of air and sea traffic of passengers and freight coming into and out of the Balearic Islands' main harbours and airports, as well as an estimation of its associated GHG emissions.
- **Intra-territorial mobility:** Indicators that allow us to draw a picture of the current vehicle stock in the region, as well as the modal split per type of fuel, vehicle and dominant transport habits.

### Scope of the baseline assessment

The **geographical scope** of the indicators was kept within the spatial boundaries of the Balearic Islands, including the islands of Menorca, Mallorca, Ibiza and Formentera.

With regards to the **temporal scope**, it is important to take the effect of the covid-19 pandemic on the economy into account across all levels (including tourism activities, support activities and services, and activities involving the supply and treatment of resources) when selecting a temporal scope. As such, the decision was made to focus on pre-pandemic values and data, using 2019 as the reference baseline year to the extent possible.

### Data used for the baseline assessment

This section lists and briefly describes the data sources used to measure and calculate indicators for the baseline assessment. The different data sources used include mainly primary data from statistical offices (IBESTAT or INE), but also official databases and reports published by the different entities of the national (the Ministry of the Ecological Transition and the Demographic Challenge, Ministry of Agriculture), regional (Government of the Balearic Islands) and local governments (Island Councils). In some cases, we also used data from indicators that had already been calculated and published on i|global, Impulsa Balear's surveillance monitor.<sup>47</sup>

### Limitations

While we managed to create and populate a complete and comprehensive framework of indicators with relatively high-quality and reliable data, the selection, measurement and calculation of indicators has been subject to certain limitations—namely the quality and availability of specific pieces of information, as well as time constraints.

- **Specific data points missing:** Although the large majority of data points were available, certain missing data points could affect the overall accuracy of the analysis. For instance, in some cases, data was available for Mallorca only and therefore was used as a proxy for the region due to the lack of data for Menorca and Ibiza.
- **Incomplete data:** Some data is incomplete, or at least not complete to the extent or level of detail expected. For instance, data on waste generation and treatment from industrial and construction sources was unavailable.
- **Inaccuracies among different sources:** In some cases, different indicators within a key focus area required data from different sources (for example, statistical databases and published reports), which can lead to inconsistencies in the values used for one or more indicators.

- **Limitations on comparability:** In some cases, indicator values for the Balearic Islands were compared to those of other autonomous communities in Spain via the National Statistics Institute (INE). However, it should be noted that these comparisons need to be put into broader context, acknowledging the main structural differences between regions. These differences include the weather, demography and seasonality of the economic activity, the ‘floating population’, the geography, the level of industrialisation, the economic structure and more. In the tourism system, all resource consumption and flows are heavily influenced by the size of the ‘floating population’, especially during the high season. While this limits the comparability of ‘per-capita’ indicator values to national averages or other regions, these indicators help estimating the burden of the pressure exerted to the different elements of the regional tourism system. Per capita values help highlight the importance of developing circular practices and infrastructure in collaboration between the public sector and key economic sectors, to cater to the demand (and therefore supply) of resources.<sup>48</sup>

### Gap and opportunity analysis

The results of the baseline assessment were analysed to gather insights about the current state of the tourism system in terms of self-sufficiency, resource intensity, waste generation and treatment, and emissions. The next step was to envision a circular future for the tourism system.

- **Defining objectives and the ideal circular state:** The ideal circular state of each key focus area was defined by identifying and setting qualitative objectives. These were defined in alignment with the *Spanish Circular Economy Strategy (2030)*, the Law of Tourism (*Ley de Turismo*) of the Balearic Islands, and the objectives set by the Environment and Territorial Council of the Balearic Islands Government for material use, packaging waste and emissions.
- **Analysing the current gap:** Based on the current state of circularity and the ideal state established for each key focus area, an assessment was conducted to identify where to focus efforts and which opportunities to explore to bridge the current gap.

A key component of the gap and opportunity analysis was the second workshop facilitated with 30 stakeholders of each key focus area. The goals of the workshop were:

- Presenting the main results of the baseline assessment and the identified objectives and opportunities.
- Engaging in an interactive session to collect local stakeholders’ inputs with regard to the opportunities for a circular tourism system.

### OUTCOMES OF THE SECOND WORKSHOP

There are many circular opportunities for the Balearic Islands’ tourism system. The conversations with stakeholders yielded insightful information about their relevance, feasibility and potential impact for the tourism system. For these opportunities, specific challenges and needs were identified, and it was determined which stakeholders could be involved in the transition towards a circular tourism system. The selected opportunities are integrated into the section outlining the Strategic Directions to follow for each key focus area.



 WATER

**Water supply and consumption**

Water is extracted and supplied from different sources to satisfy the demand of the tourism system. The majority of water is extracted from groundwater reserves (80%), followed by surface water (12%) and desalination processes (approximately 8%).<sup>49</sup> Figure eight below shows an overview of the water supply, losses and consumption by different groups within the region.

In total, about 113.7 cubic hectometres of freshwater entered the supply system in 2018.<sup>50</sup> However, once in the system, it is estimated that nearly 23% of the total supplied resources were either not properly measured by metering devices or were lost along the distribution network due to inefficiencies in the supply and infrastructure. In total, approximately 87.6 cubic hectometres of water is consumed by households (59.5%), economic sectors (34.35%) and municipalities (6.13%) in administrative buildings, public spaces and parks, schools and hospitals.<sup>51</sup> When compared to the national average,<sup>52</sup> the water consumption share from economic sectors is significantly higher in the Balearic Islands (the average for Spain is around 19.7%, compared to 34.35% in the Balearic Islands). This could be explained by the important specialisation of the region and, in particular, to the seasonal nature of the tourism activity.<sup>53</sup>

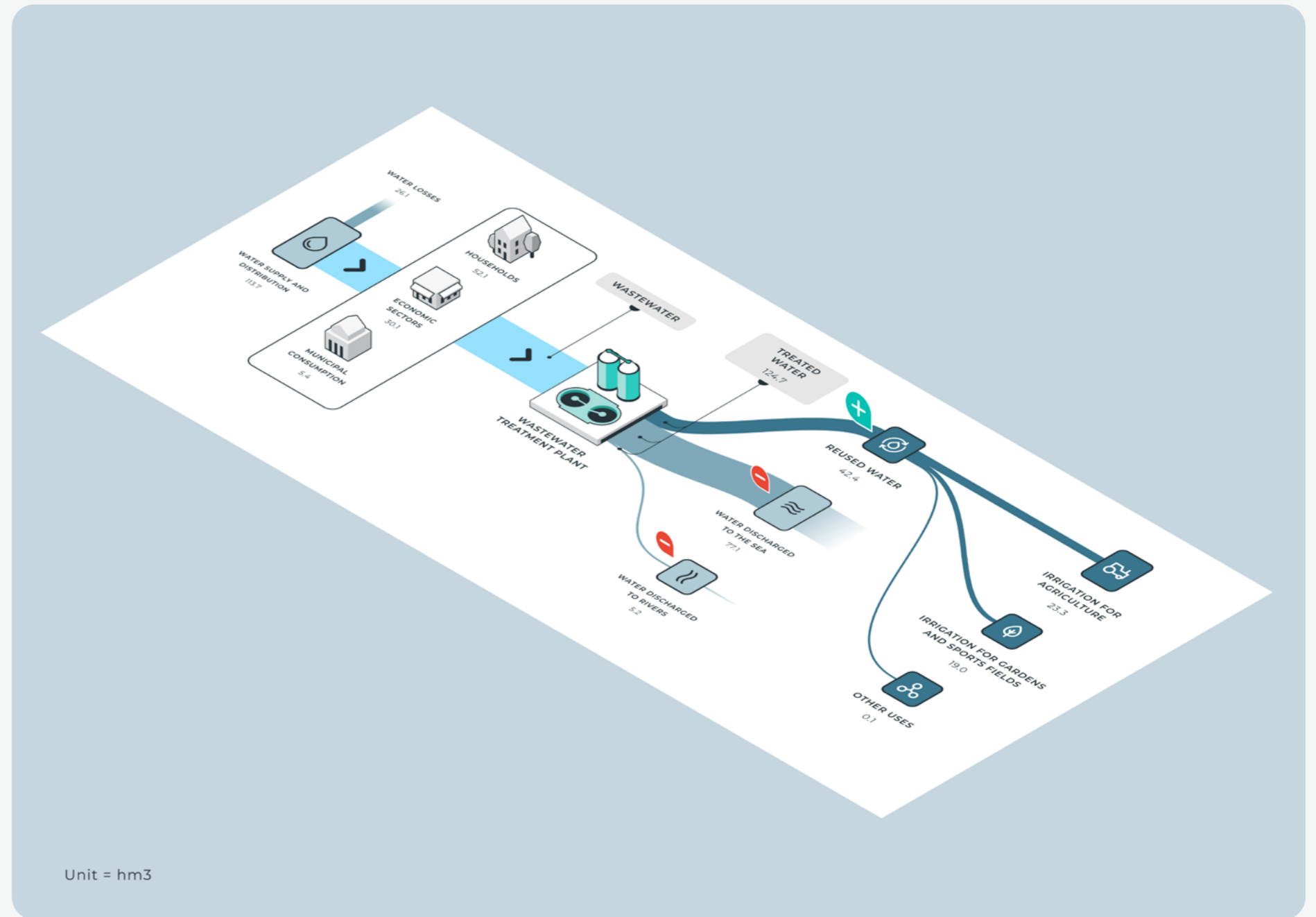


Figure eight shows an overview of the water system, including supply, consumption, wastewater treatment, reuse and discharge in the Balearic Islands.

**Water discharge and treatment**

After being consumed by households, municipal establishments and different economic sectors, almost 100% of the water coming from urbanised areas is treated in local wastewater treatment plants in order to mitigate pollution of the aquatic environment and to facilitate water reuse. Figure eight shows the fate of treated water in the region.

However, only 34% of the treated water is reused (mainly for irrigation purposes in agriculture or sports fields and gardens).<sup>54</sup> The rest is discharged after primary and/or secondary treatment (66%), principally into the sea, and in some cases in surface water bodies. This represents a large missed opportunity for the recovery and reutilisation of water, which would in turn reduce the need to extract freshwater. However, the root of the problem is not in the poor reutilisation performance of the region or the low quality of treated water. Instead, it appears that the supply of reused water is currently much larger than the actual demand for it, especially due to the lack of infrastructure that would enable local reutilisation. The region is lacking reservoirs to store reused water, and there is currently no independent water recirculation infrastructure, except in very few new urbanisation projects.<sup>55,56</sup>

Evaluation category	Current state description	Ideal circular state	Bridging the gap
<p><b>SUPPLY AND CONSUMPTION</b></p> <p><b>Total supply:</b> 113.6 hm<sup>3</sup></p> <p><b>Losses due to inefficiencies:</b> 22.9%</p> <p><b>Consumption per capita:</b> 204 litres/capita/day</p>	<p>The water supply is mostly from groundwater sources, the system is not self-sufficient since it needs treatments like desalination to fulfil the demand.</p> <p>High water consumption and significant losses in the distribution affect the natural cycle of water.</p>	<p>In an ideal circular state, water would be consumed at the same rate as hydrological resources are recharged, minimising losses and avoiding unnecessary overconsumption.</p> <p>Buildings and activities do not create local water stress, and the use of materials and products with a high water footprint are avoided or otherwise minimised.</p> <p>Water quality is matched to appropriate uses and is cascaded intelligently.</p> <p>Water-saving appliances are used to conserve the quantity and quality of water.</p>	<p>Losses in the water network appear as a key concern standing in between the current and ideal state and, therefore, should be prioritised in the tourism system.</p> <p>Moreover, the Balearic tourism system should explore ways to control and optimise overall consumption to maintain hydrological resources in a safe space.</p>
<p><b>WATER DISCHARGE AND TREATMENT</b></p> <p><b>Total wastewater treated:</b> 341,865 m<sup>3</sup>/day</p> <p><b>Water reutilisation rate:</b> 34%</p> <ul style="list-style-type: none"> <li>• <b>Agriculture:</b> 55%</li> <li>• <b>Gardening and Sports fields:</b> 44.8%</li> <li>• <b>Other:</b> 0.2%</li> </ul>	<p>Most of the treated water is discharged into the ocean.</p>	<p>In an ideal circular state, reincorporation of treated water into productive activities should be maximised. The rest is used to recharge overexploited aquifers, minimising the amount discharged back into the sea close to zero.</p> <p>Nutrients and resources from wastewater are effectively recovered and managed.</p>	<p>Reincorporate as much wastewater as possible into the tourism system's productive cycles. This can be achieved through innovative programmes to assess the opportunities for reincorporating water into streams.</p> <p>The current infrastructure needs to be adapted to recharge the reservoirs and recirculate water flows.<sup>57</sup></p>

Table two displays a vision and gap analysis for water in the circular tourism system.

 ENERGY

**Energy production, supply and consumption**

The tourism system is highly dependent on external energy sources (Figure nine), imported from other countries and from mainland Spain, to fulfil the local demand. In fact, only 6.39% of the system's total energy consumption is generated locally, primarily consisting of waste-to-energy generation (84.84%), biomass (6.03%), biogas (1.82%) and local electricity generation (7.31%).<sup>58</sup> The rest is imported from abroad (93.61%), and, as shown in Figure ten, consists almost entirely of imported fossil fuels used locally to either generate electricity on local thermal power stations or used as fuel for local marine, air and road transportation. This contributes to the region's overall annual GHG emissions.<sup>59</sup>

Out of the total energy consumed in the Balearic Islands, only 6.35% is considered renewable, coming from the local generation of electricity from renewable technologies, and the electrical interconnexion (from the mainland) that has been generated using renewable energy sources:<sup>60</sup>

- The local production of renewable energy comes from biogas, biomass, as well as local electricity generation from solar and, to a much smaller extent, wind power.
- The islands are also supplied with electricity from the mainland through an underground cable (Figure ten), of which roughly 38.9% can be considered renewable according to 2019 national grid estimates.<sup>61</sup>

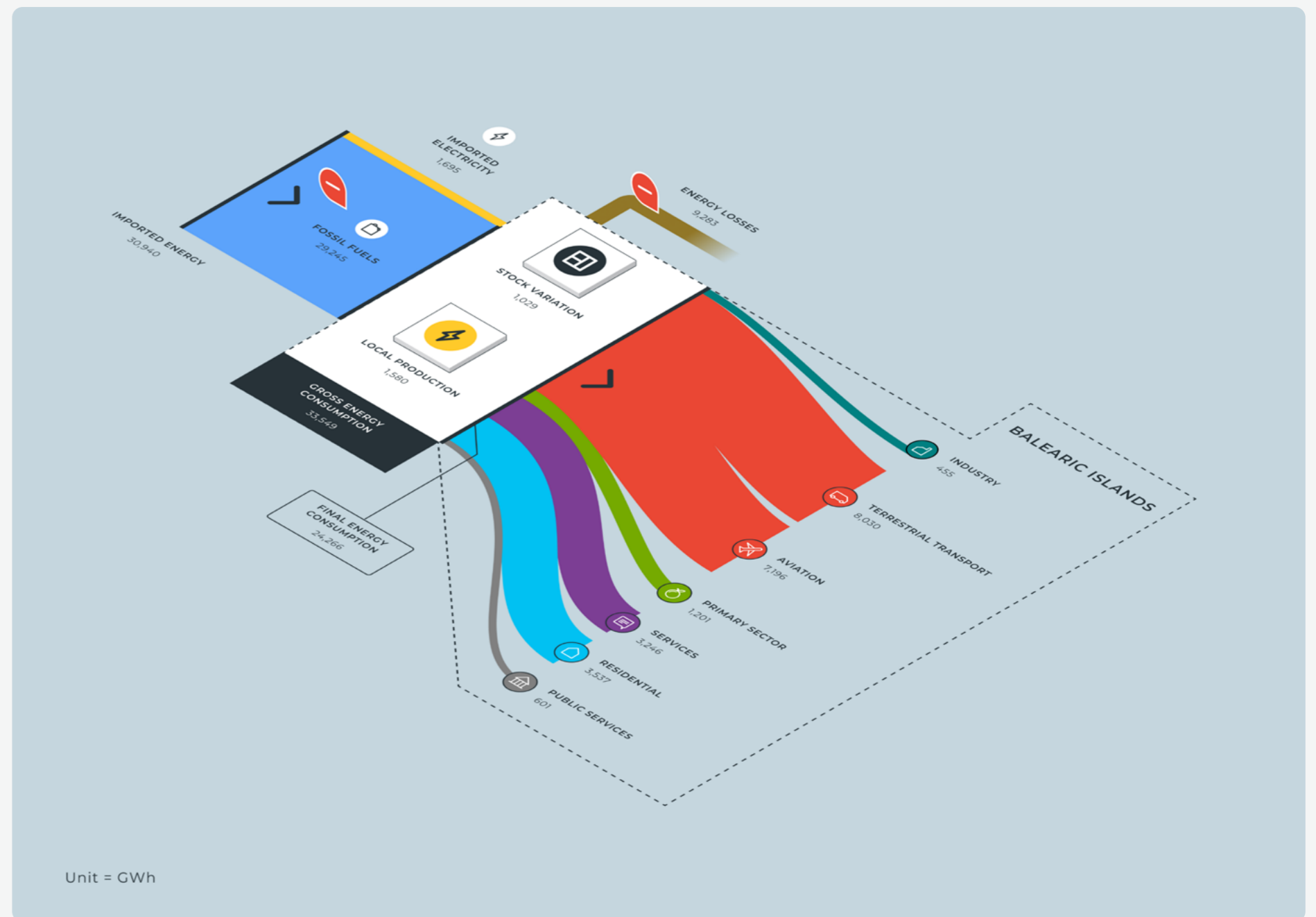


Figure nine shows energy supply, production and consumption in the Balearic Islands.

## 2 SETTING A BASELINE AND UNDERSTANDING OPPORTUNITIES

In total, the final energy consumption of the region in 2019 was equivalent to 24,266 gigawatt hours. Looking at the consumption sectors, it is not surprising to see that the two largest energy consumers are terrestrial (33.1%) and air (29.7%) transport, which currently rely almost entirely on fossil fuels. Far behind transportation, residential use (14.6%) and services (13.4%) drive energy consumption. Moreover, the energy demand is much smaller in sectors such as agriculture and manufacturing, as the region's economy has gradually become more service-based (growing the tourism sector). This implies a general de-industrialisation 62 and the decline of the agricultural sector, in terms of production and land cover.<sup>63,64,65</sup>

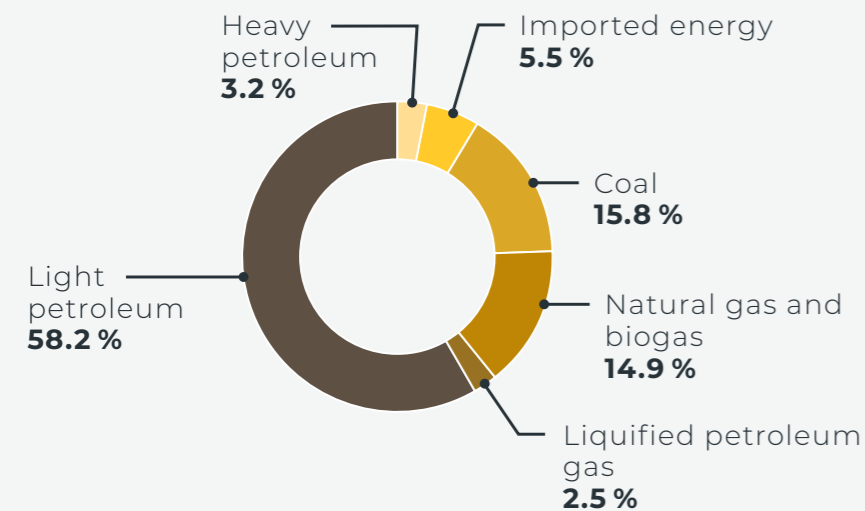


Figure ten shows a breakdown of the energy sources imported to the Balearic Islands.

### Energy efficiency

As is often the case with energy systems that rely primarily on fossil fuels, a high percentage (27.7%) of the gross energy consumption was lost (see Figure nine) by converting fossil fuels to electricity in thermal power plants, in addition to grid inefficiencies in 2019.<sup>66</sup>

Buildings also play an important role in energy efficiency. From the choice of building materials, type of construction and their operational phase (use-phase), buildings are major drivers of energy consumption. As such, energy efficiency measures for buildings play a crucial role in optimising final demand from residential, commercial and other service sectors, which are particularly important to the tourism system. However, as shown in Figure eleven, currently, nearly 82% of all registered and energetically-certified buildings fall within the three lowest Energy Accreditation categories (E-G).

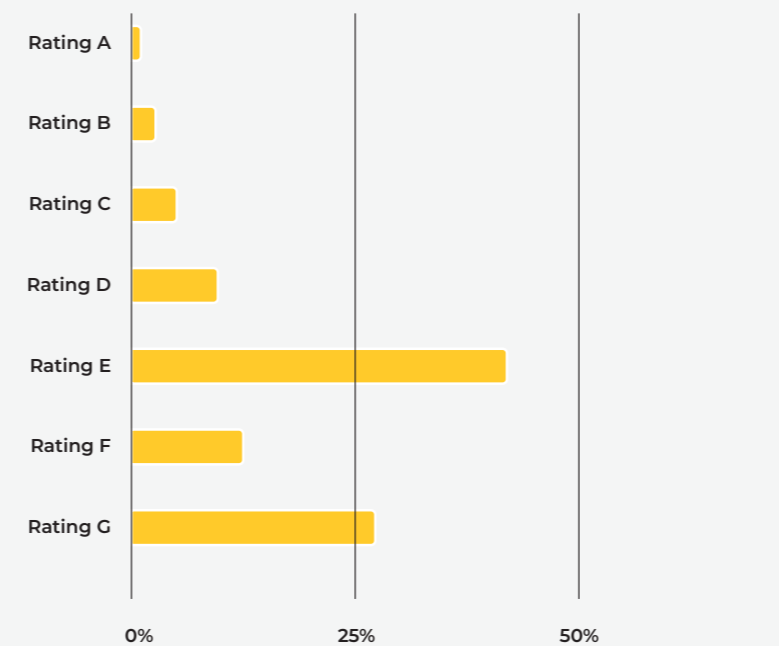
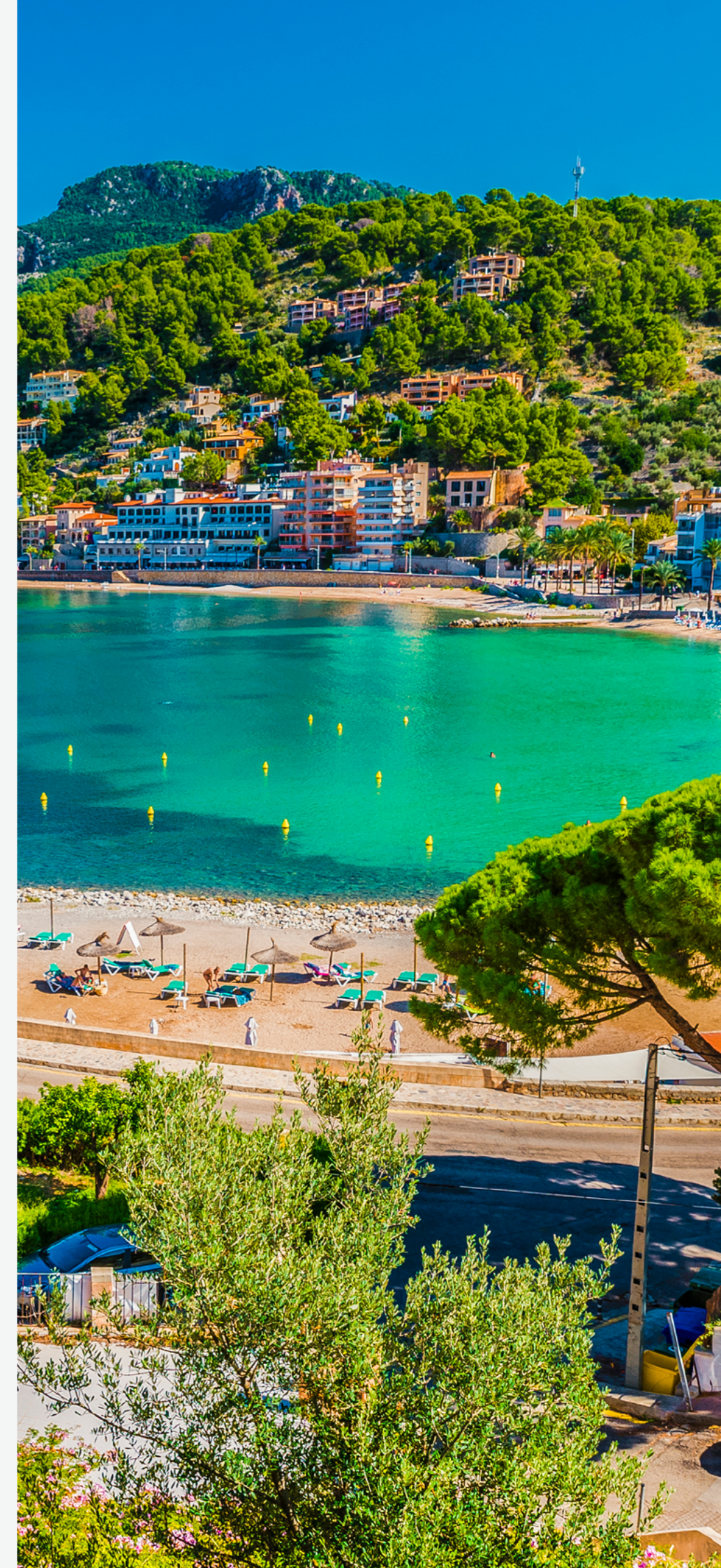


Figure eleven shows the breakdown of energy certifications for registered buildings in the Balearic Islands.



## SETTING A BASELINE AND UNDERSTANDING OPPORTUNITIES

Evaluation category	Current state description	Ideal circular state	Bridging the gap
<p><b>PRODUCTION, SUPPLY AND CONSUMPTION</b></p> <p><b>Renewable energy rate:</b> 6.35%</p> <p><b>Energy self-sufficiency:</b> 6.39%</p> <p><b>Total energy consumption:</b> 24,266 gigawatt hours</p> <ul style="list-style-type: none"> <li>• Transport: 62.8%</li> <li>• Household: 14.6%</li> <li>• Services: 13.4%</li> <li>• Agriculture: 4.9%</li> <li>• Public use: 2.5%</li> <li>• Industrial: 1.9%</li> </ul>	<p>External dependence on fossil fuel resources to fulfil demand. The local production of energy is only 6.4% of the total, and this production is mainly from incineration plants. Moreover, the conversion process from fossil fuels to electricity has a high percentage of energy loss.</p>	<p>In an ideal circular state, 100% of electricity, heat and transport fuels are generated from renewable sources, most of which are locally produced, reducing GHG emissions associated with energy production. Use and efficient storage of distributed energy sources (such as solar, wind, biomass and geothermal) are maximised in ways that ensure minimum stress on critical materials.</p>	<p>The different elements of the tourism system should maximise the interlinkages with the energy supply activities to increase their capacity to produce and store energy from renewable sources.</p> <p>This could improve self-sufficiency and reduce emissions associated with fossil energy production. Nevertheless, increasing renewable energy is associated with the consumption of resources, such as storage batteries and photovoltaic panels. Therefore, an entire life cycle approach should be considered to best manage these resources.<sup>67</sup></p>
<p><b>ENERGY EFFICIENCY</b></p> <p><b>Energy losses due to inefficiencies in conversion and distribution processes:</b> 27.7%</p> <p><b>Buildings within the top four energy certification categories (A-D):</b> 18.3%</p>	<p>The built environment is not energy efficient. Most buildings have low energy efficiency.</p>	<p>In an ideal circular state, overall building efficiency is optimised to the highest standard, which enables reduction of energy consumption. Energy is managed in a smart and adaptive way, appliances operate at the highest efficiency, and passive energy is maximised.</p>	<p>The use of fossil energy and the current state of the built environment represent clear barriers for the tourism system to become truly energy-efficient. By switching to cleaner energy sources and leveraging urban and territorial planning, the system could maximise energy efficiency in the built environment, both for the existing building stock and new construction. These adjustments might require some renovation or retrofitting, which should also be handled with circular economy principles to prioritise the value of resources.<sup>68</sup></p>

**Table three** displays a vision and gap analysis for energy in the circular tourism system.

MATERIALS

Material extraction, supply and consumption

As shown in Figure twelve, the region relies heavily on imports from the rest of Spain and other countries to satisfy its demand for materials and resources. Indeed, imports represent nearly 62% of the total direct material input in the region, and consist primarily of fossil fuels (34.6%), biomass (29.5%) and other types of materials (such as metallic and non-metallic minerals) in the form of manufactured and semi-manufactured products (see Figure thirteen).<sup>69</sup>

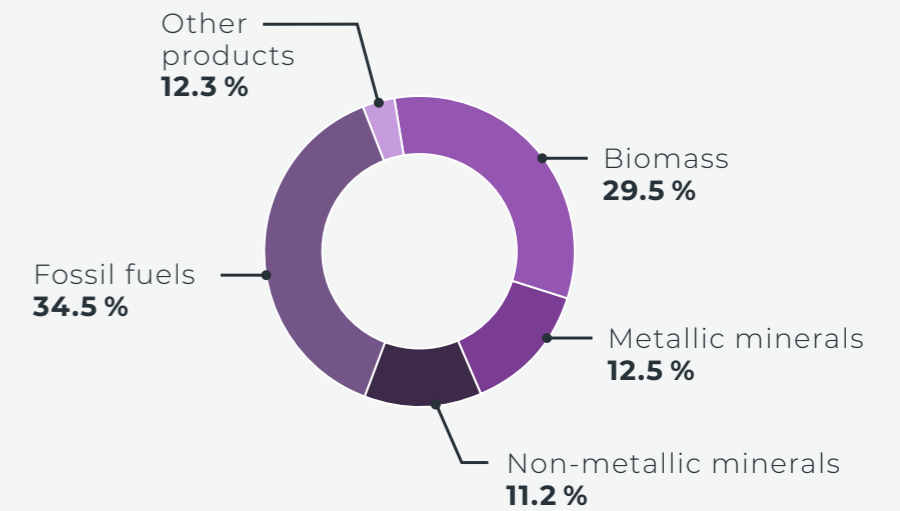
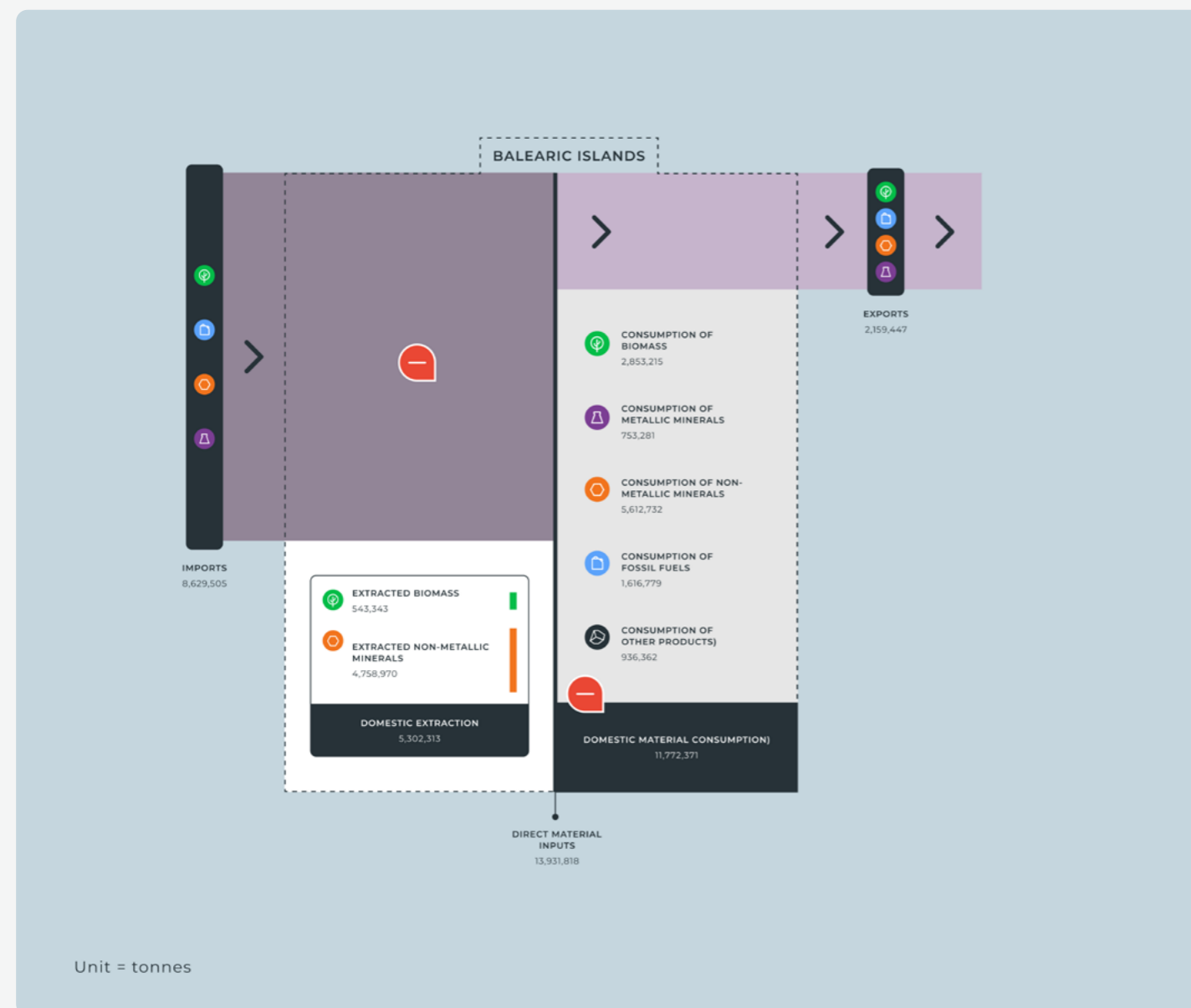


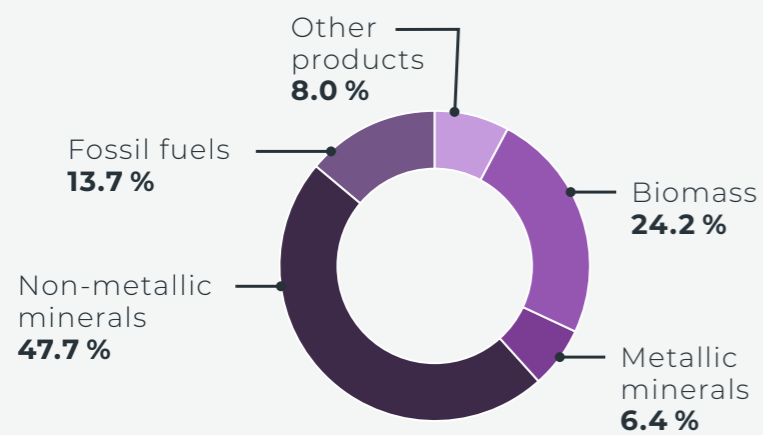
Figure thirteen gives a breakdown of the materials and resources imported to the Balearic Islands.

Figure twelve gives an overview of the material supply and consumption in the Balearic Islands.

## 2 SETTING A BASELINE AND UNDERSTANDING OPPORTUNITIES

Locally, domestic extraction consists primarily of non-metallic minerals (mainly rock materials used in construction such as marble, granite, sandstone, limestone, plaster), and to a lesser extent, biomass (crop harvest and residues, livestock, timber). The region exports only a relatively small proportion of the direct material inputs (5.70%),<sup>70</sup> consisting primarily of biomass, metallic and non-metallic minerals.

In total, the region consumed 11,772 thousand tonnes of materials in 2019,<sup>71</sup> which is equivalent to 9.83 tonnes per capita. As mentioned in the limitations, this figure is heavily influenced by the effect of consumption from the floating non-resident population during the high season. Non-metallic minerals make up the largest portion of material consumption (47.7%), followed by biomass (24.2%) and fossil fuels (13.7%) (see the breakdown in Figure fourteen).



**Figure fourteen** illustrates the breakdown of the domestic material consumption of the Balearic Islands.

It is evident that non-metallic minerals and biomass are both major drivers of domestic material consumption and the two main types of domestically extracted materials.

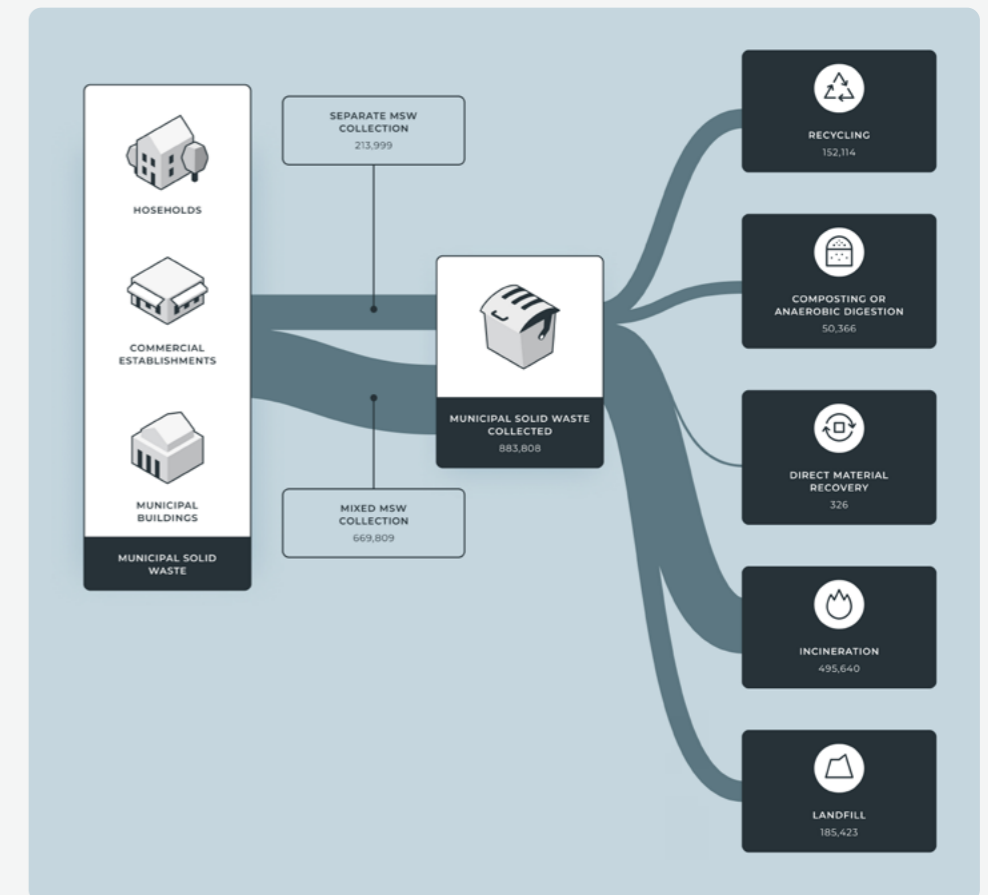
An indicator of material self-sufficiency was calculated: results suggest that 45% of the total local demand for materials is satisfied with local extraction and production. However, this consists primarily of non-metallic minerals mainly used for construction. Therefore, the region still relies largely on imported semi-manufactured and manufactured goods.

### Waste generation and treatment

In 2019, the Balearic Islands generated **883.8 thousand tonnes of municipal solid waste**,<sup>72</sup> approximately **738 kilograms per capita**.<sup>73</sup> According to the waste generation and treatment audit published by the Environment and Territorial Council,<sup>74</sup> 38.5% of the total municipal solid waste (MSW) was generated by commercial activities, of which 86% (so 33% of the total waste) came from hotels, restaurants and bars. Waste generation is one of the indicators which is most influenced by the effect of the seasonal variation in population in the islands, as shown by the study.<sup>75</sup> Waste generation and the associated value loss from wasted resources are the main arguments to develop circular economy practices that focus on making consumption more sustainable and closing the material loops.

As shown in Figure fifteen, the large majority of MSW is collected without having undergone proper separation of different waste streams: 75.8% of the total is collected as 'mixed' waste, whereas only 24.2% is collected through separate streams (principally glass, plastic packaging, and paper and cardboards).<sup>76</sup> Such a low separate collection rate directly influences the system's capacity to send waste for material valorisation options such as reuse and recycling. Instead, we can observe that 77% of total collected MSW cannot be recovered and are therefore incinerated (56.1%) or landfilled (20.96%).<sup>77</sup> Some incineration plants in the Balearic Islands are equipped with waste-to-energy technology, allowing for energetic valorisation of waste for on-site use or feeding back to the grid.<sup>78,79</sup>

However, from a circular economy point of view, energy recovery is placed lower than material valorisation in the waste mitigation and treatment hierarchy,<sup>80</sup> as it still represents a lost opportunity to maximise the useful life of material resources, and prevent waste by cycling materials back into the economy.



**Figure fifteen** gives an overview of the waste collection and treatment flows in the Balearic Islands.

## SETTING A BASELINE AND UNDERSTANDING OPPORTUNITIES

Evaluation category	Current state description	Ideal circular state	Bridging the gap
<p><b>PRODUCTION, SUPPLY AND CONSUMPTION</b></p> <p><b>Material Consumption:</b> 11,772 thousand tonnes or 9.83 tonnes per capita</p> <p><b>Renewable Material Input rate:</b> 24.2%</p> <p><b>Material Self-sufficiency:</b> 45%</p>	<p>There is a high dependence on imports for most materials, especially semi-manufactured and manufactured products, but there is an elevated extraction of non-metallic minerals.</p>	<p>In an ideal circular state, consumption per capita of virgin and scarce material is minimised as much as possible or to the extent that it is sensible.</p> <p>Materials and components are designed to be reused at high quality over multiple life cycles to the extent that it is possible. The use of renewable materials are prioritised within the limits of sustainable production and ecosystem conservation.</p>	<p>To achieve its ideal circular state, the tourism system needs to increase the rate of circular and renewable material consumption, meaning extracting less minerals and using available renewable resources. Moreover, material consumption should be optimised. The built environment is a major driver of material footprint and consumption, and as such, should be prioritised as one of the most important and influential drivers of circular change.</p>
<p><b>WASTE GENERATION AND TREATMENT</b></p> <p><b>Total MSW Generation:</b> 738 kilograms per capita</p> <p><b>Separate MSW collection rate:</b> 24.2%</p> <p><b>MSW Recovery rate:</b> 22.95%</p>	<p>The current material use generates high volumes of waste, especially from tourism activities. There is additionally a low rate of selective collection of waste, which results in high incineration and landfill rates and a limitation of recycling rates.</p>	<p>In an ideal circular state, overall building efficiency is optimised to the highest standard, which enables reduction of energy consumption. Energy is managed in a smart and adaptive way, appliances operate at the highest efficiency, and passive energy is maximised.</p>	<p>To minimise waste generation, efforts should be put into ensuring products are used for as long as possible. Product-as-a-service schemes and reuse initiatives can foster circularity in the use phase.</p> <p>On the other hand, local capacity for the recovery of materials should be enhanced and increased to maximise waste diversion.</p>

Table four presents a vision and gap analysis for materials in the tourism circular system.

 FOOD

**Food production and consumption**

Agriculture, livestock and fishing play an important role in the tourism system, and directly interact with the islands' natural capital. Agriculture and livestock production represents nearly 36.2% of the Balearic Islands' total land cover. On the whole, the Islands' agricultural practices are more sustainable than those of the rest of the country: synthetic fertiliser use, for example, is much lower than the Spanish average,<sup>81</sup> and 18.8% of agricultural land use is considered to be 'sustainable'—more than double the Spanish average (9.3%).<sup>82</sup>

While local production seems to be on the right path to contribute to a more sustainable agricultural system, currently it is not sufficient to satisfy the entire demand for food products of the tourism system. As shown in Figure sixteen, the Balearic Islands consumed a total of 1,316 thousand tonnes of food and drinks in 2019.<sup>83,84,85</sup> The region had the highest food and drink consumption per capita, based on a sample survey of household and extra-domestic consumption from residents, with approximately 752 kilograms per resident per year (compared to the Spanish average of 621 kilograms per resident per year).<sup>86</sup>

This consumption is high and highly dependent on the import of food from the mainland, the rest of Europe and the world. Studies on the food value chain were conducted on each island, and revealed that the tourism system of the Balearic Islands are far from food self-sufficiency. For instance, in Mallorca, only 15% of the food and drink demand is being fulfilled by local production.<sup>87</sup> A similar situation takes place in Menorca, where only 16% of the food demand can be satisfied by local production.<sup>88</sup> For Ibiza and Formentera, this figure is far lower, at 3.9%.<sup>89</sup>

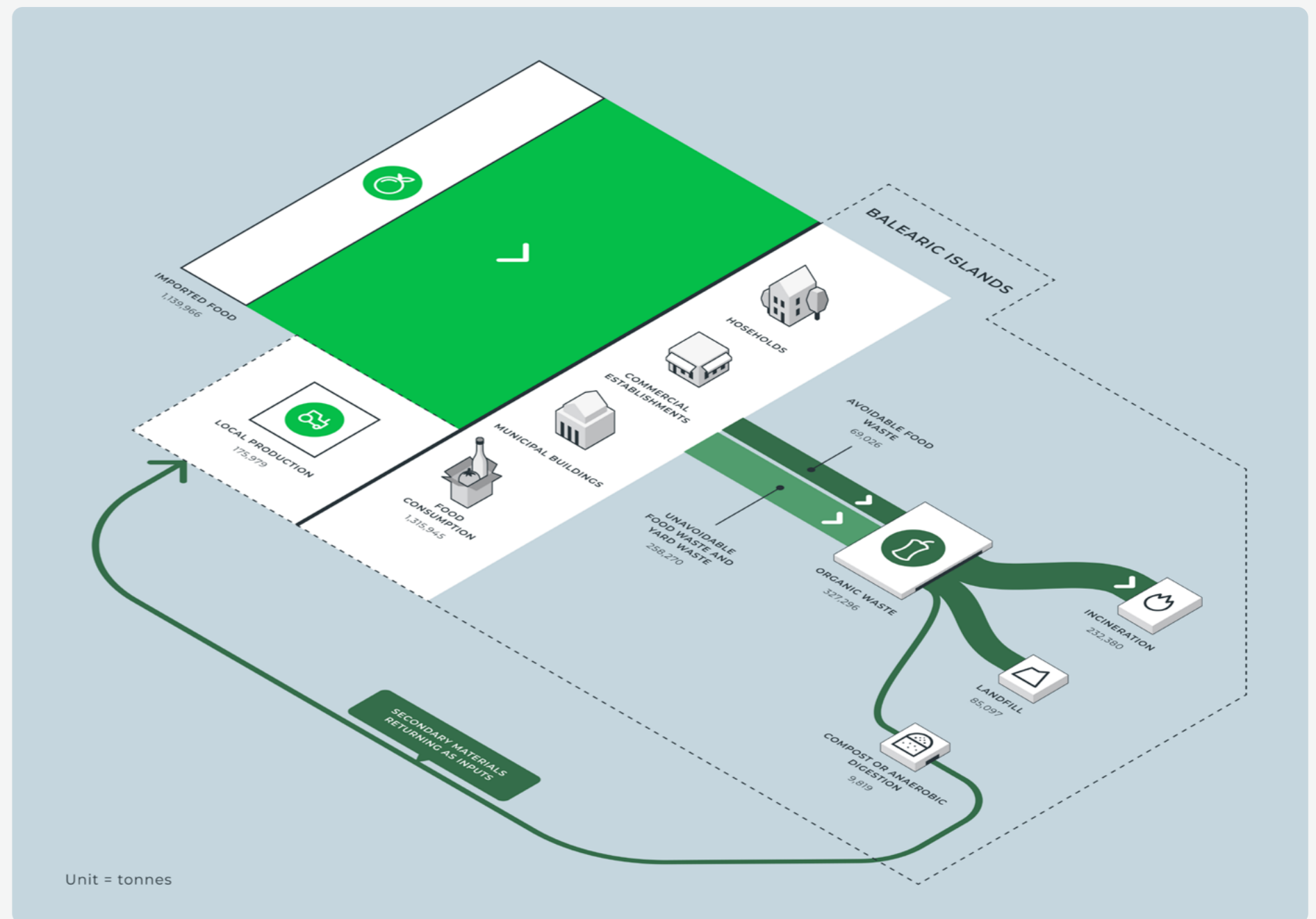


Figure sixteen gives an overview of food inputs and organic waste generation and treatment flows in the Balearic Islands.

**Food waste generation and emissions**

Not only does the tourism system consume significant amounts of food, it also produces a considerable volume of food waste. The waste audit estimates that in total, 56,452 tonnes of food were wasted in households,<sup>90</sup> equivalent to approximately 38 kilograms per capita every year. Including waste from commercial establishments, this figure rises to 69,026 tonnes, or 46 kilograms per capita. This refers to any form of edible food that is wasted: for example, discarded cooked or raw food, or food remaining in dishes from food service establishments. It is estimated that edible food waste represents between 16 and 27% of the organic waste fraction of MSW.<sup>91</sup> Other forms of organic waste generated consist of unavoidable food waste (such as peels, pits and bones) and mixed yard and garden waste.<sup>92</sup>

Approximately 90% of all organic waste (including food waste) was disposed of as mixed waste,<sup>93</sup> and therefore not separately collected, decreasing the quality and valorisation potential of organic waste.<sup>94</sup> Thus, it was found that 97% of organic waste could not be valorised and reintroduced into the biological resource cycles. In 2019, only 3% of all organic waste was valorised, either materially (transformed into compost or digestate), or by generating renewable energy (biogas) through anaerobic digestion (see Figure sixteen). Again, while we acknowledge that a fraction of the incinerated organic waste is being valorised energetically through incineration treatment, other mature treatment options for organic waste exist that would allow for direct recovery of valuable nutrients and their reintroduction in the biological cycles (for example, composting), or recover low-carbon energy such as biogas.<sup>95</sup> In more recent years (2021), there was a significant improvement in organic waste valorisation from 3% to 17%.<sup>96</sup> However, this still represents a small fraction of the total.

Evaluation category	Current state description	Ideal circular state	Bridging the gap
<b>PRODUCTION AND CONSUMPTION</b> <b>Area of agricultural land under sustainable practices, out of total cultivated land:</b> 18.84% <b>Consumption of food:</b> 1316 thousand tonnes, or 752 kilograms per capita <b>Food self-sufficiency:</b> 15.4%	The region depends on food imports to fulfil demand. Food self-sufficiency percentages vary from island to island; nonetheless, it is nowhere near self-sufficient. Additionally, the Balearic Islands consume more food than any other autonomous community in Spain.	In an ideal circular state, local regenerative and circular agriculture is the norm, and local food production represents a large share of what is consumed in the region.  Residents and visitors consume seasonally and locally to reduce the ecological footprint of food consumed.	The tourism system increases local capacity for regenerative and circular food production, enabling and facilitating collaboration among stakeholders in the local food supply chain.  Support and educate residents and visitors on sustainable food consumption habits that can enable a transformation in the local food system.
<b>WASTE GENERATION AND TREATMENT</b> <b>Total MSW Generation:</b> 738 kilograms per capita <b>Separate MSW collection rate:</b> 24.2% <b>MSW Recovery rate:</b> 22.95%	High rates of food are disposed of and low quantities are recovered. Moreover, organic waste streams are combined in mixed waste. Regarding treatment methods, incineration and landfill are the most popular for organic waste. These methods are not regenerative since essential soil nutrients are lost in the process.	In an ideal circular state, food waste is primarily avoided but ultimately cascaded to the highest possible value. No food waste is incinerated or sent to landfills.	Awareness raising among visitors and residents plays a crucial role in decreasing avoidable food waste. However, in alignment with efforts in the Materials key focus area, local capacity for the recovery of food waste should be enhanced and increased to maximise diversion and create synergies with local regenerative and agriculture practices (in the form of organic fertilisers, feedstock or compost).

Table five displays the vision and gap analysis for food in the circular tourism system.

 MOBILITY

**Inter-territorial mobility**

Inter-territorial transport plays an essential role in the tourism system as it connects the Balearic Islands with the Spanish mainland, but also with other countries in Europe and the rest of the world. Indeed, given their geographical context and limited capacity, the islands' harbours and airports must manage the arrival and departure of freight as well as passengers. Overall, it is estimated that 16,310 thousand tonnes of freight pass through the main transportation hubs, principally via marine transport (16,298 thousand tonnes or 99.93%),<sup>97</sup> and a minor fraction is transported by air cargo (11.7 thousand tonnes or approximately 0.07%).<sup>98</sup> The islands also experience significant traffic in terms of human transport, with almost 51 million passengers visiting the islands' main ports and airports. Given the current nature of transportation between the islands, the rest of Spain and other countries, and the lack of low-carbon fuel alternatives, inter-territorial transport is a significant contributor to the total GHG emissions generated in the region, with roughly 4.42 metric tonnes of CO<sub>2</sub> emitted on an annual basis.<sup>99</sup>

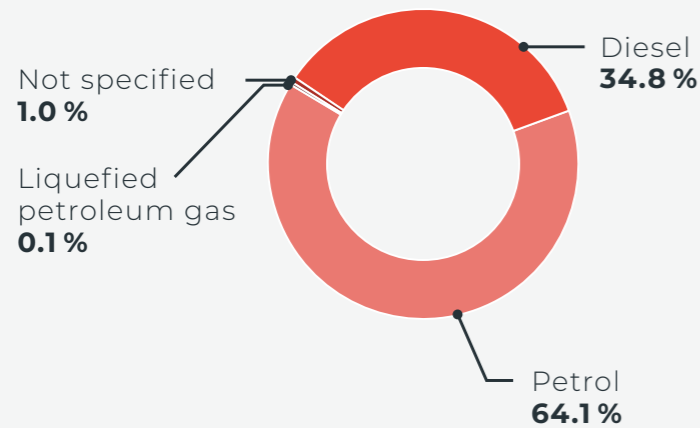


Figure seventeen shows vehicle stock in the Balearic Islands, by type of fuel.

**Intra-territorial mobility**

Within the region, the current mobility is mainly oriented towards private vehicle ownership and use. In total, the Balearic Islands accounts for 1,131,656 vehicles registered (using 2019 as a baseline),<sup>100</sup> which corresponds to a ratio of approximately 1.2 vehicles per inhabitant over 18 years of age (and therefore of legal driving age).<sup>101</sup>

Additionally, only 2,718 of the total vehicles registered in 2019 were electric (0.24%), revealing that the current mobility needs are not only predominantly satisfied by the use of private vehicles but also entirely dependent on imported fossil fuels.

What's more, the use of public transportation services is rather low. For instance, only 16.3 million travellers utilised the inter-municipal public transport services in Mallorca in the entire year of 2019,<sup>102</sup> which corresponds to 17.7 trips per inhabitant of the island in a year. Palma is the largest and capital city of the region, and thus a municipal area where we could expect the highest use of public transportation services. However, statistics show that inhabitants of the capital only use the city's buses 8.7 times per month (0.2 times a month by train or metro).<sup>103</sup> It must be noted that if the floating population was included in these calculations, these values would drop significantly as the use of public transport is higher during peak months.

Evaluation category	Current state description	Ideal circular state	Bridging the gap
<b>INTER-TERRITORIAL MOBILITY</b> <b>Freight traffic:</b> 16,310 thousand tonnes • 99.9% by sea • 0.01% by air <b>Associated GHG emissions:</b> 4.42 million tonnes CO <sub>2</sub>	High dependence on fossil fuels for the mobility of passengers and goods through the Balearic Islands.	In an ideal circular state, the transportation of passengers and goods is optimised to reduce the carbon footprint from the combustion of fossil fuels and alternative renewable energies become the norm.	Steer the mobility of the tourism system towards greater circularity, meaning going further than decarbonisation. For example, optimising logistics in terrestrial transportation reduces transportation time and increases efficiency for both passengers and goods.
<b>INTRA-TERRITORIAL MOBILITY</b> <b>Private vehicles per inhabitant:</b> 1.2 <b>Public transport use:</b> 17.7 trips per inhabitant per year <b>Associated GHG emissions:</b> 2.82 million tonnes CO <sub>2</sub>	There is a strong dependence on private transportation and low use of public transport, and the transition towards electric vehicles is occurring slowly.	In an ideal circular state, clean, efficient and multimodal mobility is available for both residents and visitors, such as public transport, sharing low-carbon mobility or (e-)cycling. Residents and visitors choose low-carbon and efficient mobility options for environmental, economic and cultural reasons.	While electrification of mobility is key for a circular economy, the tourism system must strive to further reduce its material footprint by adopting and promoting shared mobility options.  Efforts should be put into increasing the shared mobility supply. Promote services such as car pooling, shared cars, and micro-mobility (such as bicycles and electric scooters), as well as freight services such as electric cargo bikes for last-mile delivery. <sup>104</sup>

Table six displays a vision and gap analysis for mobility in the circular tourism system.

## THE KEY ROLE OF TERRESTRIAL AND MARINE ENVIRONMENT

The Balearic Islands' tourism system is highly dependent on natural ecosystem services and the existing infrastructures that enable its effective functioning. Therefore, it is key to emphasise the transversal role of the Terrestrial and marine environment in the transition toward a circular tourism system for the islands.

Across the five key focus areas described in the previous sections, it is key to implement territorial planning and management practices that ensure positive synergies between circularity and the Terrestrial and marine environment. Specifically:

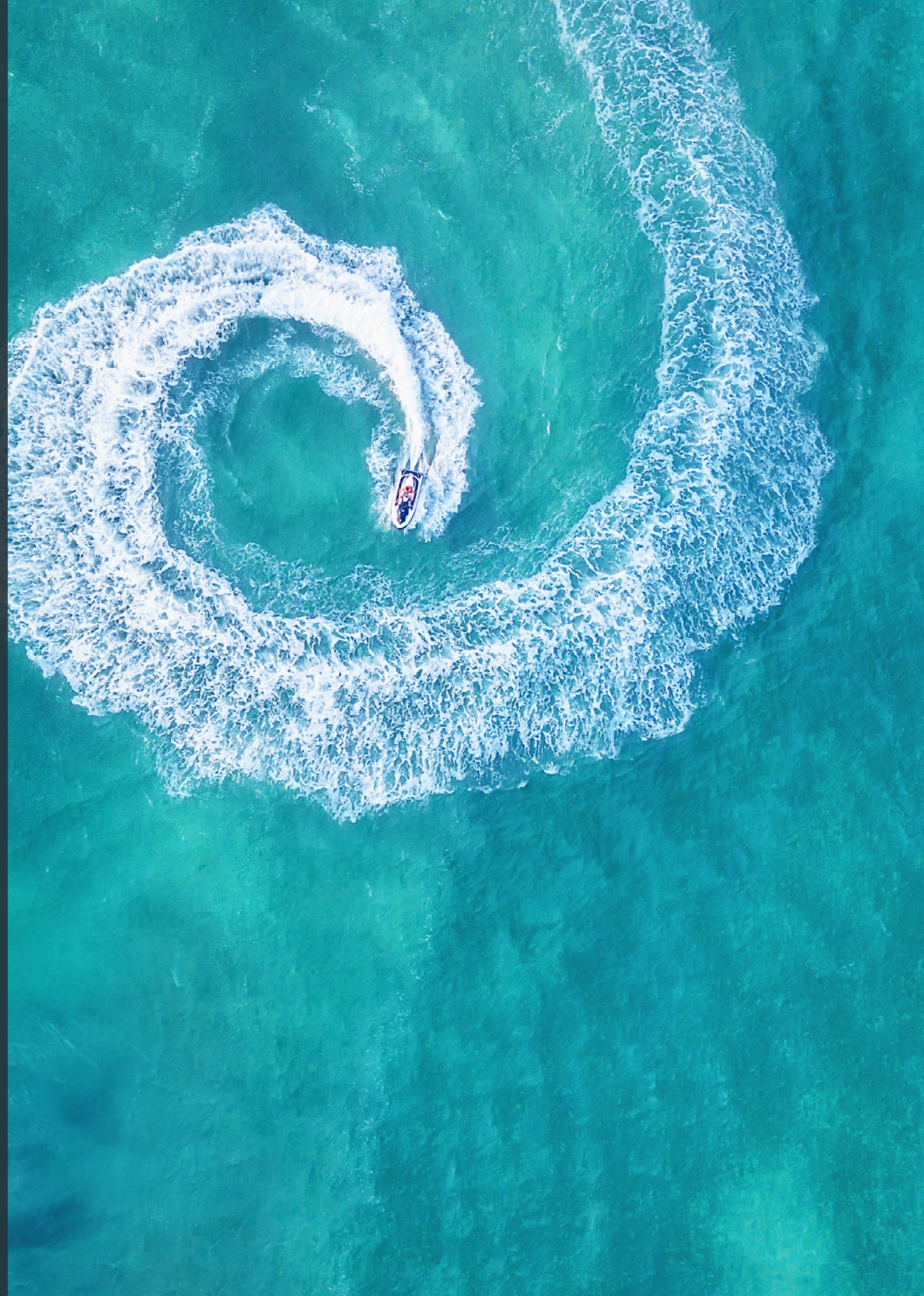
- New territorial management guidelines must be put into practice to ensure the multifunctionality of ecosystems, since these, for example, provide food, regulate the climate, enable groundwater recharge, and allow cultural and recreational activities.
- The blue economy should be implemented to define the productive use of the sea, promoting the protection and restoration of marine ecosystems.
- Beyond covering growing volumes of resource and material flows, the management of infrastructures and equipment must be reoriented in order to avoid value and resource leaks and capture new value.

By accelerating the update of circularity in Water, Energy, Materials, Food and Mobility, the tourism system will be able to benefit from the ecosystem services provided by the local environment. Thus, the transition to a circular tourism system must ensure that the local carrying capacity is not exceeded and avoids an irreversible degradation of the natural assets of the region. This should, over time, lead to an improvement in water stress index (30.9 in 2019),<sup>105,106</sup> the volume of waste dumped into the sea (53.2 kilograms of garbage per linear kilometre of coastline),<sup>107</sup> the surface of contaminated soil (20,000 m<sup>2</sup> in 2017),<sup>108</sup> or eroded (23.39% in 2017),<sup>109</sup> and the number of threatened species (19 species of flora and 15 of fauna in 2023),<sup>110</sup> among many others.



**3**

# STRATEGIC DIRECTIONS



The baseline assessment of the Balearic tourism system reveals an economic model that is still far from circular. On one hand, the tourism system is largely dependent on resources imported from the peninsula and from other countries, and on the other hand, materials and products are rarely cycled back into productive use at their end-of-life, and typically follow a take-make-use-waste model. For each of the key focus areas assessed, strategic directions must be defined to guide action towards a more circular tourism system.

Each of the following aspects are described for each strategic direction:

- **Vision and description:** A description of the strategic direction and the circular future it envisions for the key focus area.
- **Prioritised opportunities:** A description of the circular opportunities of greatest priority, as well key case studies that illustrate similar initiatives locally or in other regions.
- **Impact potential:** A description of the environmental and socioeconomic benefits that each opportunity could bring.
- **Stakeholders:** Making the tourism system more circular will require collaboration between various stakeholders, who need to be clearly identified with clearly delineated roles and responsibilities. It's especially pertinent to outline regional and municipal authorities' roles, the policy instruments they can use to advance circularity, and how they can coordinate with broader stakeholder groups to drive circular opportunities forward.



## WATER | DEVELOPING A CIRCULAR AND RESILIENT WATER SYSTEM

### Vision and description

A circular water system is essential to enable the self-sufficiency and development of the Balearic tourism system: it is directly linked with all key activities, such as core tourism activities, but also the key activities (agriculture and industry) and the supporting services behind them (see Figure two). Therefore, it's essential that local actors develop a circular water system. One that fosters clean and efficient water cycles, optimises water consumption, increases the recirculation of water into the system for high-value reuse, designs out waste and pollution, and preserves and regenerates local hydrological resources.

In achieving this ambition, it will be essential to take a holistic approach by collaborating with other key focus areas of the tourism system, such as energy (water utilities producing renewable energy and reaching energy neutrality, for example) and food production (recovering key nutrients from wastewater and creating a new revenue stream by selling fertilisers to cover operating costs, for example), but also in economic sectors such as industry (by maximising the use of treated water for industrial users, for example).<sup>111</sup> This systemic approach should also leverage technology and innovation to digitalise the water system for better monitoring and traceability.

### Opportunities

#### 1. Enhance infrastructure to minimise inefficiencies and leakages

An opportunity identified as crucial in developing a circular water system is enhancing the existing infrastructure to minimise water losses due to leakages and inefficiencies in the distribution network.

An initial step could be conducting a water audit and inspections to identify and monitor such inefficiencies and leakage points.<sup>112</sup> Resources will be needed to perform necessary maintenance and repair processes, but also to upgrade infrastructure to more

modern and efficient technologies. This also represents a chance for the water system to modernise and digitalise, leveraging new technologies such as smart water monitoring tools, increasing the transparency and traceability of the water flowing through the supply chain.



#### [Optimisation of existing wastewater treatment plants in Sao Paulo](#)

This joint initiative between SABESP and 2030 Water Resources Group, was launched in 2019 to boost the circular economy in wastewater treatment. The project's objective is to optimise the existing wastewater treatment plant's performance and maximise the treatment capacity of existing infrastructure. The desired effects of this initiative are to maximise resource use, reduce waste generation and pollution and regenerate natural systems.

#### 2. Scale innovation and research programmes for the development of treated water reuse

Appropriate solutions must be found to address treated water's currently low reutilisation rate. The supply of treated water must be matched with new forms of demand. Innovation programmes and spaces for the development of water reuse systems should be explored,<sup>113</sup> both at a larger scale for wastewater treatment plants, but also for domestic and private stakeholders in the form of greywater reuse systems.

Local stakeholders have identified the opportunity and necessity to increase knowledge capacity for the sustainable management of local water resources: with the creation of a dedicated technological and research centre, for example.



[The Catalan Institute for Water Research \(ICRA\)](#) is a research centre with the purpose of research, knowledge transfer and innovation in the sustainable use of water. It primarily addresses the state of ecosystems, water resources, the impact of new products, new technologies for the treatment and use of resources, especially in the Mediterranean. It centres its focus on the role of human activity in hydraulic resources.

### 3. Reduce water consumption with appropriate incentive mechanisms

Local stakeholders have indicated that limiting consumption through pricing mechanisms would not be the most successful option. The current cost of water is so low that most domestic and private users would be willing to pay the extra cost to maintain their consumption levels. Instead, stakeholders have recognised an opportunity to establish regulatory measures that tackle water consumption during the time periods with the highest human pressure on the islands. These measures could be complemented by subsidies and/or tax exemptions: this could allow consumers to adapt by, for instance, installing water discharge regulating devices, or deploying new technologies (such as drip-irrigation for agriculture).

To maximise efficiency and acceptance, regulatory measures may be accompanied by awareness-raising and education efforts.<sup>114</sup> These may be aimed at general consumers, highlighting the need to manage and consume water sustainably, especially in the context of the Balearic Islands.



The [Cape Town Water Strategy](#) was formed to provide sufficient water for all citizens and shape a climate-resilient water strategy. It aims to promote the responsible use of water, by all water users, through pricing, regulations on greywater reuse systems and public education campaigns. With this strategy, the city aims to ensure sufficient water is reliably available from diverse sources, to provide the greatest possible economic, social and environmental benefits.

### Impact potential

**Environment:** Implementing the opportunities identified can have an important impact in terms of reducing overall water consumption and increasing the water reutilisation rate at the end-of-the-pipe. This would subsequently reduce the water system's impact on the environment, by decreasing the pressure on local water reserves, and thus reducing the risk of critical water stress. This is especially pertinent in the summer months, when conditions are dryer and in which consumption is highest due to the high human pressure on the islands.

**Socioeconomic:** The proposed opportunities could modernise the water network through digitalisation and innovation. This would increase efficiency and thus reduce operational costs, creating cost-saving opportunities for consumers. It also represents an opportunity for substantial cost savings in productive activities such as agriculture, industry and other water-intensive sectors,<sup>115</sup> making the case to attract private investment and foster public-private collaboration.

#### EXPECTED CHANGES FOR KEY INDICATORS:

- Reduction of total water consumption
- Reduction of total water lost due to inefficiencies and leakages in the water distribution network
- Reduced water stress index
- Increase in the water reutilisation rate

### Terrestrial and marine environment

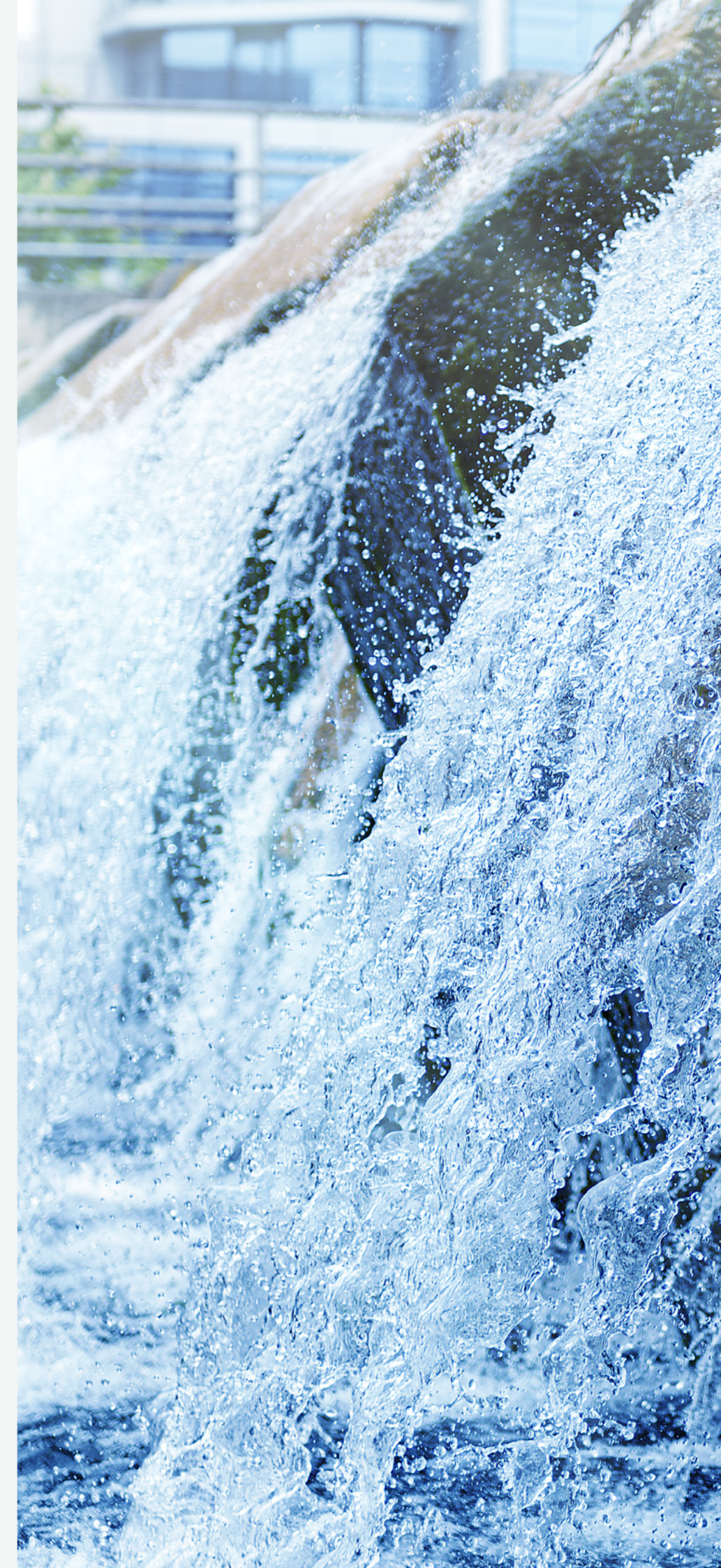
Spatial planning and management of terrestrial and marine environments are essential mechanisms to start practically implementing solutions within the opportunities identified.

- **Opportunity 1:** Using multi-criteria spatial analysis networks to map and create the links between water infrastructure planning and territorial and urban planning, in order to optimise the location and design of the developments needed.<sup>116</sup>
- **Opportunity 2:** Leveraging and boosting scientific knowledge in research institutes will contribute to the protection of the marine environment, the sustainable development of the coast and the protection of fisheries, human health, social welfare and tourism.<sup>117</sup>

### Stakeholders

- **Water suppliers:** The main water supply companies play a central role in this strategic direction, consisting of publicly-owned (Abaqua, EMAYA, Calvia 2000) and private companies (Aqualia, Suez). Water suppliers manage the supply across the territory of the islands and at the municipal level, and as such will play a major role, in particular regarding improvements in distribution networks, but also in providing greater transparency and traceability of water flows.
- **Policymakers:** By coordinating efforts between the Balearic Islands Government, Councils, municipalities and publicly-owned water management companies, policymakers and local authorities can facilitate the transition by creating an enabling environment for the uptake of circular water opportunities. They can also ensure the enforcement of new regulations and laws.
- **Technological sector:** Industrial clusters, technological institutes and water companies should work together and share their knowledge, skills and expertise to find innovative solutions, such as digitalisation and the monitoring of consumption processes.

- **All consumer groups,** from domestic users to private companies and entities within the accommodation, food and beverage, agricultural and industrial sectors must be brought together in the transition. They play a particularly important role in the practical implementation of water reuse solutions, which will enable closing the loops and extending the time water remains in circulation within the tourism system.





## ENERGY | TOWARDS A RENEWABLE SUPPLY AND EFFICIENT USE OF ENERGY

### Vision and description

The Balearic Islands' tourism system is highly dependent on fossil fuel imports for the generation, distribution and consumption of energy. Currently only 6.35% of the energy consumed comes from renewable sources, mainly from local production.

The transition towards a cleaner and more self-sufficient energy system is key for the long-term sustainable development of the tourism system, and the circular economy has a key role to play. The circular economy prioritises the uptake of renewable energy, ensuring its effective planning and deployment, by identifying context-appropriate technologies and energy sources, planning the optimal land use for its deployment, and developing a more efficient energy consumption, in particular through the built environment.

To improve energy self-sufficiency within the Balearic tourism system, public and private actors will need to work together and invest in the planning and development of local infrastructure for the production and storage of renewable energy. Taking an integrated approach from the design of urban and territorial planning phases will be key. This way, stakeholders can utilise circular strategies to create material- and energy-efficient buildings. Appropriate territorial and urban planning must be coupled with the rollout of clean and local energy solutions, such as low-carbon heat pumps for heating and cooling, energy efficient appliances and changes in energy use habits.

By combining these different measures, the Balearic tourism system can radically reduce energy and material demands for the transition to clean energy,<sup>118</sup> and drastically reduce the GHG emissions associated with energy production and consumption in the islands.

### Opportunities

#### 1. Prioritise the production of renewable energy

Prioritising the local production of renewable energy is a key lever to boost energy self-sufficiency. This has already been recognised by the local government with the Energy Transition Law passed in 2019.<sup>119</sup> To realise this opportunity, significant investments in infrastructure will be necessary. Given the geographical particularities of the archipelago, solar energy is considered the main option to produce local and renewable energy. This can be done through solar collector systems for heating and water boiling, or photovoltaic panels for the generation of electricity—but also through generation of green hydrogen, which can be applied both in transportation and buildings (such as hotels and homes). Funding programmes, platforms and subsidies will be key to finance this transition and mitigate the high up-front cost of new infrastructure developments.<sup>120</sup> To this end, the Balearic tourism system is a clear candidate for funding platforms such as INSULAE's h2020: Menorca, for example, is already a follower island, where investment planning tools could be replicated.<sup>121</sup>

Finally, energy communities have a key role to play in democratising renewable and smart energy use, especially in places where grid-related problems may occur.<sup>122</sup>



[INSULAE h2020](#) is an EU funded project that helps islands find locally produced, sustainable and low-cost energy sources through the deployment of innovative solutions. By developing an Investment Planning Tool (IPT), the project enables energy planners and other stakeholders to compare and evaluate different scenarios to create action plans for the islands to generate their own sustainable and low-cost energy.

#### 2. Develop local storage capacity

As a complementary measure to the uptake of solar energy in the tourism system, energy storage capacity must be scaled up significantly to reduce the dependence on continuously available energy from fossil sources.

Storage solutions such as flow-battery systems have already been trialled in other regions of the world, and in particular islands.<sup>123</sup> These technologies require significant investments and, as mentioned by the local stakeholders during the workshops, are often not financially viable if operated in isolation. However, the responsibility and cost-necessities for their management can be shared among several companies: in the case of the tourism system, infrastructure could be used by several hotel resorts, residential neighbourhoods, leisure centres and restaurants in key areas of the islands).

Smart energy storage systems are cropping up across the world: technologies that use batteries from electric vehicles as storage systems and sources of electricity for smaller consumers such as households, for example.<sup>124</sup> As an increase in the number of electric cars in the tourism system is expected, this solution could be explored, especially in areas where cars are typically parked most of the time: parking lots, or private garages in new urban developments for example.



[Europe's largest commercial energy storage system](#) uses electric vehicles (EV) batteries to provide sustainable energy for stadium events. This smart energy storage system combines power conversion units and the equivalent of 148 new and used Nissan LEAF batteries, to store the energy captured by 4,200 solar panels on the roof of the stadium as well as some grid supply.

### 3. Ensure urban planning supports an energy-efficient built environment

A focus on the built environment is key to address energy efficiency in the tourism system. Energy can be saved substantially through a combination of electrification and reduced energy demand. To do so, effective territorial and urban planning and coordination efforts will be required. Several municipalities have already integrated the energy transition with measures affecting the built environment and urban planning into their short-to-medium term plans to phase out fossil fuels.<sup>125,126,127</sup>

Local stakeholders have highlighted that planning cities in an integrated way will be necessary to successfully deploy energy efficiency improvements in urban contexts. In this sense, Balearic municipalities could also consider the development of positive energy districts (PEDs): urban areas with high energy efficiency and adaptability, due to smart energy systems and the utilisation of roof space as an asset for solar energy generation, especially in Mediterranean cities.<sup>128</sup>



[Low-Emission Development Plan in Bogor, Indonesia](#) - After a thorough multi-stakeholder consultation effort, the City of Bogor, Indonesia revised its existing spatial planning frameworks and strategically integrated a low-emission development strategy in its five-year *Development Plan*. By creating an emissions inventory, the city government was able to prioritise low-carbon opportunities and identify concrete, implementable projects in the built environment such as pedestrianisation and streetlight retrofitting.

#### Impact potential

**Environment:** Overall, by moving towards a more renewable supply and efficient use of energy, the tourism system could substantially decrease its overall energy-related emissions. However, it is important to consider that the development of local energy generation and storage capacity also represents a territorial trade-off, which may detract land from other various purposes: agriculture, conservation and urban development, for example.

#### **Socioeconomic:**

- **Energy self-sufficiency:** Implementing the opportunities identified can have an important impact on the islands' energy system. On one hand, it will contribute to the development of a long-term, resilient and more cost-efficient energy system, by increasing local capacity for the generation and distribution of renewable energy. Reduced exposure to external shocks and changes in the supply and global prices of primary energy sources—as we are currently seeing given the global geopolitical context—may be one direct economic benefit.
- **Employment:** Locally, the energy transition also represents a valuable opportunity for job creation: the opportunities proposed will require a new skilled workforce, capable of deploying and operating new renewable energy technologies, but also integrating them into current energy systems.

#### EXPECTED CHANGES FOR KEY INDICATORS:

- Increase in the renewable energy use rate
- Increase in total energy self-sufficiency
- Increase in the share of building with energy certifications A–D
- Decrease in GHG emissions associated with energy transformation and consumption

#### Terrestrial and marine environment

Spatial planning and management of terrestrial and marine environments are also essential mechanisms to start practically implementing solutions within the opportunities identified.

- **Opportunity 1:** The options described to generate energy locally may lead to land use tradeoffs and competition for land between solar panels, storage facilities, and agriculture. Therefore, an integrated land use planning approach will be needed to re-think how the terrestrial and marine environment can be used for energy production.
- **Opportunity 3:** Urban planning can be leveraged to promote energy efficiency, for example, by redesigning energy positive districts for the optimization, adaptation and development of energy efficient Islands.

#### Stakeholders

- **Landlords:** These play an essential role in deploying renewable energy technologies. As noted, local energy generation capacity will directly compete for land with other needs (protected areas, agriculture, real estate). Land owners should therefore be involved from the early stages of territorial and urban planning to increase the uptake of renewables in the tourism system.
- **Regional and local authorities:** These stakeholders can incentivise private sector investment, and can facilitate administrative processes related to building renovation, renewable energy installation or the commission of environmental impact assessments, among others.
- **Energy producers and distributors:** These play and will continue to play a crucial role in making the energy transition circular. They are the ultimate responsible for investing in new technologies and deploying circular, clean and efficient energy systems.
- **Skilled labour:** The installation, operation and maintenance of new renewable technologies requires specialised skills and technical expertise. The tourism system should find ways to attract or train skilled workers to fulfil this need.
- **Citizens and visitors:** These stakeholders must acknowledge the necessity of improvements in energy self-sufficiency in the tourism system, and understand how this fits within the broader circular economy transition.



## MATERIALS | CIRCULAR MATERIAL USE WITHIN THE TOURISM SYSTEM

### Vision and description

Production and consumption processes in the Balearic tourism system are material-intensive—and the majority of materials are imported from other regions and countries. These elevated consumption and production patterns also fuel substantial waste generation across sectors.

The transition to a circular tourism system must incorporate three circular key actions: use less, use longer and use again, to decrease the consumption of new materials and close material loops. The circular transition would result in increased material productivity, more materials cycled or reused, and minimal waste generation. This would support the region and its tourism system in drastically increasing its self-sufficiency and establishing strong and stable collaborations with circular suppliers from other regions and countries.

### Opportunities

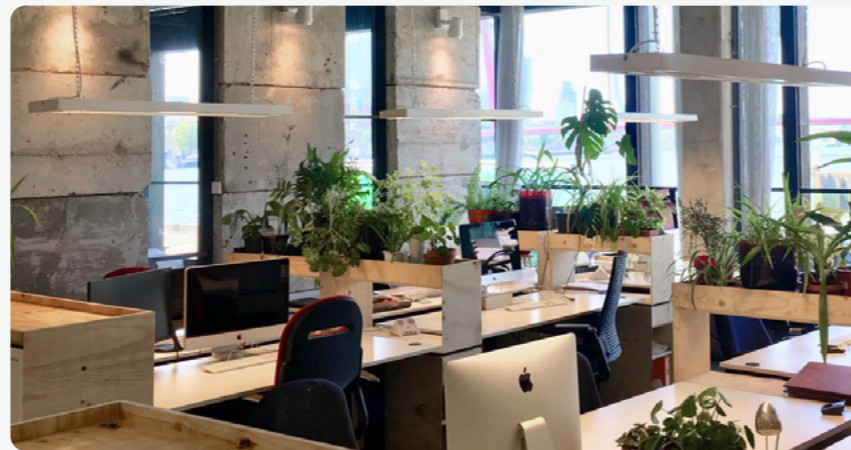
#### 1. Build a circular built environment

Due to the sector's heavy material use, a focus on material efficiency and the use of circular and renewable materials in the built environment will be crucial.

During the second workshop, there was a general agreement among local stakeholders working in the construction, circular products retail and material recovery sectors on the importance of incorporating circular principles from the design phase. This includes design for modularity and adaptability, the prioritisation of functionality and longevity, and avoiding 'over-design'.

The use of circular and renewable materials must also be prioritised: using reclaimed materials, such as textiles or dried seagrass, for insulation, for example.<sup>129,130</sup> To support this, monitoring and traceability systems for construction materials,<sup>131</sup> such as material passports and Building Information Modelling (BIM)<sup>132</sup> can provide information on the type and value of materials in a structure, their environmental impact, and how easily they can be disassembled and recovered.

Lastly, measures could be taken to limit the expansion of the built environment, particularly to protect the islands from increasing urbanisation of their coastlines.



[Superuse Studios](#) is an architecture collective for circular and sustainable design that tackles each stage of the construction process, with a focus on harvesting and reusing construction materials in its circular designs. At Superuse Studios, reuse is viewed as an integral element for design and applies to building materials as well as to energy supplies, human resources, water, traffic and food cycles.

#### 2. Encourage circular use of products and furniture in households and public and private establishments

Circular contracting programmes can be implemented to stimulate the circular purchase of products and furniture in commercial and administrative establishments.

Design also plays a key role in making the use of products and services more circular. The choice of material and the monitoring of their impact are also key to maintain transparency and traceability of the type of resources used. To this end, stakeholders have also recommended the implementation of Environmental Product Declarations for consumables<sup>133</sup> such as furniture and other goods in households, public and private establishments (e.g. hotels and other accommodation types, but also in the procurement for goods and furniture in public buildings).

Repair stores, the resale of second-hand items and other local initiatives can help boost the exchange of circular and second-hand goods. For instance, Prague has developed a growing network of Re-Use Points throughout the city, where citizens can drop off their unwanted yet still-functional furniture, sports equipment or appliances.<sup>134</sup>

In addition, circular business models—such as Product-as-a-service or rental—must be encouraged. This may be especially suitable for household appliances, and maintenance, gardening and cleaning equipment.



[ReTuna](#) is the world's first recycling shopping mall. Initiated by the municipality of Eskilstuna in Sweden, this shopping mall is an example of a city acting as a circular catalyst. The shops in the mall only sell items that have been used before, therefore extending the lifetimes of a range of products, from furniture and textiles to sports equipment.

#### 3. Develop local recycling and recovery waste infrastructure

Municipal collection systems may be adapted to facilitate waste separation and collection, with a specific focus on improving the separate collection of organic waste.

Stakeholders working in the waste management sector (both municipal and construction waste) have mentioned that public administration compliance with the current legislation will be key to the success of this opportunity. In particular, they highlighted that the separate waste collection requirements laid out by current legislation are not properly enforced across the different municipalities.

Public investment will also play a key role in the development of recycling infrastructure to increase local capacity and sovereignty in waste treatment.

Innovative business models focused on physical and digital reverse logistics and redistribution systems and platforms can complement public sector efforts. There are many exemplary initiatives that have proven the business case for these platforms, for different products and resource streams: deposit schemes for specific waste (bottles, electronics, textiles and scrap metal, for example), or reverse logistics schemes for consumer goods (HP or Amazon, for example)

Balearic municipalities could extend a reward system to incentivise separate collection at the consumer level. This reward system could incorporate programmes to exchange packaging and other types of waste for vouchers, discounts and other economic benefits to incentivise consumers to participate in waste collection.



[Ljubljana—Frontrunner in waste separation and collection system](#)—In 2014, Ljubljana became the first European capital to announce zero waste ambitions. Through three main strategies, the city aims to reduce the amount of waste sent for disposal by 95% whilst maintaining low costs: 1) The city has managed to increase its separate collection of organic waste by embracing a door-to-door collection system, specifically focused on the collection of organic waste; 2) The city has lowered the frequency of residual waste collection, forcing people to separate either waste efficiently; 3) The city has conducted effective communication campaigns, targeting citizens with a focus on

waste prevention and reuse. In just over ten years, the city was able to more than double its recycling rate, reaching 68% in 2018. Today, its landfill receives almost 80% less rubbish, making it a top EU capital for recycling.

### Impact potential

**Environment:** In terms of environmental impact reduction, more circular material use in the Balearic Islands' tourism system would have clear benefits:

- **Resource efficiency** and material savings, and the use of secondary and renewable resources. These have proven benefits in terms of embodied and operational energy savings (and as such, GHG emission reductions), as well as reduced material and carbon footprints beyond the scope of the tourism system.
- **Reduction of waste**, from consumer goods to construction and demolition materials. Circular material use can prevent these materials from becoming waste in the first place.
- **High potential for the reduction of contamination and emissions** from current incineration and landfill practices through increased material recovery.

**Socioeconomic:**

- **Value creation:** Capturing waste streams' residual value—especially for construction and demolition waste—would likely provide financial benefits.
- **Employment:** Incorporating these circular opportunities may foster the creation of new jobs, for example related to the development of new waste treatment infrastructure, as well as highly-skilled jobs for circular construction practices.

### EXPECTED CHANGES FOR KEY INDICATORS:

#### Materials

- Decrease in total material consumption
- Increase in the share of renewable materials consumption as part of total material consumption
- Increase in the material self-sufficiency of the tourism system
- Decrease in GHG emissions from waste treatment
- Increase in separate waste collection
- Decrease in total waste generation
- Increase in waste recovery rates

#### Environment

- Decrease in rubbish accumulation in the sea
- Improved biodiversity

### Terrestrial and marine environment

Spatial planning and the management of terrestrial and marine environments represent essential mechanisms to start practically implementing solutions within the identified opportunities.

- **Opportunity 1:** Urban and territorial planning may aim to limit the expansion of the built environment, through the adaptive reuse of idle buildings and urban spaces, for example.
- **Opportunity 2:** Hubs for second-hand goods reverse logistics should be identified based on their strategic geographical location on the islands.
- **Opportunity 3:** Hubs for second-hand goods reverse logistics should be identified based on their strategic geographical location on the islands.

**Stakeholders**

- **Balearic Islands administrations, and in particular the Balearic Institute of housing<sup>135</sup>** will play a key role in facilitating the administrative processes related to the management of resources at their end-of-life to enable valuable material recovery. For this, it is likely that regional and municipal governments will also need to align with the national government as many of the current barriers are set by national policies.
- **Professional collectives of architects, engineers and constructors** will need to be consulted and involved in all future projects related to urban planning and new built environment developments, to integrate new concepts of circular construction and planning such as design, adaptive use of idle spaces and the choice of circular and renewable materials.
- **Waste management companies**, both for municipal solid waste and for special (construction and industrial) waste streams such as industrial and construction waste, will be at the centre of the development of local recycling capacity.
- **Accommodation and food service establishments** are important contributors to the economy, but also important consumers of materials and generators of waste. However, they are ideal drivers of change, and should be involved in the piloting and trial of circular solutions: in the construction and renovation of buildings, and in the offering of circular products and services, for example.
- **Private companies** already working in the repair, refurbishment and retail of circular goods, as well as companies working in technology, innovation and digitalisation for the development of Product-as-a-Service solutions, will have a key role to play in the transition.
- **Citizens and visitors** will play an important role, especially in ensuring waste separation, shifting their behaviour towards more circular product use and familiarising themselves with circular services (repair and maintenance, for example).





## FOOD | TOWARDS A CIRCULAR AND REGENERATIVE FOOD VALUE CHAIN

### Vision and description

The tourism system strongly depends on imports from other regions and countries to cover the demand for food and drinks, as the islands have limited capacity for local food production. This is particularly relevant because the rates of imports could grow if there is greater demand, and self-sufficiency and resilience may decrease in tandem. The region also experiences difficulties with the treatment and management of food waste, where more effective and efficient practices could be explored.

A circular and regenerative agricultural and food value chain can help the Balearic tourism system by: 1) introducing and expanding regenerative agriculture practices that build soil and sequester emissions, and 2) by developing waste separation and treatment, as well as private initiatives that tackle food waste. Developing a circular and regenerative food chain will enable the Balearic tourism system to leverage the opportunity to source food products more locally, creating positive synergies between local farmers and food producers, residents and touristic activities, and regenerative forms of land use. These circular solutions can be coupled by focusing on changing consumer habits as well as minimising value losses in distribution and packaging systems and post-consumer waste.

### Opportunities

#### 1. Develop regenerative agriculture practices

Providing support and protecting various local agricultural activities will be important to increase sustainability in the agricultural sector. To this end, an important matter flagged by local stakeholders was the need to increase the financial viability and competitiveness of local producers and retailers, which struggle due to competition from imported food coming from intensive production systems and sold in major supermarket chains.

Municipal and regional authorities may work together by increasing financial support for sustainable and local agriculture. The role of the local community will also be key for increasing the viability and dignification of production and local initiatives.

Bringing consumers closer to the producers through the creation and promotion of farmers markets, digital platforms and the servitisation of direct food distribution from producers to consumers will also be key to strengthen local agriculture.

The protection of agricultural land must also be regulated, to limit the use of inorganic fertilisers and pollutants and ensure the sustainable use of local arable land.



[Ghent—Creating local and regenerative food value chains](#)—The Belgian city of Ghent was among the first European cities to launch its own urban food policy. The comprehensive food strategy, Ghent en Garde, was designed to strengthen short food supply chains and increase sustainable production and consumption, while increasing accessibility to better food and decreasing food waste. Using co-creation and participatory governance, Ghent's food policy has enabled widespread structural change in the urban food chain.

#### 2. Encourage circular public and private procurement of food products

Local governments will have a vital role in boosting demand for local produce and leading by example. The Balearic Islands' municipalities may collaborate with different actors involved in catering, accommodation, and offices to develop guidelines for the public procurement of food services or products. Local policies may include limiting the sale of bottled water, or establishing contracts for public food services from organic farming to the supply of fresh, seasonal or zero-kilometre products.

Beyond public procurement, procurement decisions from private actors working in the food and drink sector will also be needed to maximise impact, from actors involved in the supply and distribution steps of the value chain in particular as well as major centres of consumption such as food service establishments and hotels. Incentivising these actors to embark on this circular transition by prioritising local, seasonal and low-impact products will therefore be a key step for this opportunity.

Similarly, it will be important to leverage the solutions and potential that innovation and technology can provide in this context, for instance through the use of digital platforms for the retail and redistribution of food before it can be discarded.<sup>136</sup>



[Turku—Embracing circular food procurement](#)—Turku, Finland has committed to decreasing lifecycle food service greenhouse gas emissions through circular procurement. To reach its goal, the municipality set out targets for food waste reduction and percentage of vegetarian meals served. In addition to these targets, the circular procurement department also tracks emissions from food service contracts using an emission monitoring tool, in order to serve meals with a lower footprint: these are provided by nearly 140 different types of kitchen facilities in educational and care institutions and facilities.

### 3. Implement awareness campaigns to reduce consumption (especially of bottled water) and food waste

Cross-cutting awareness campaigns can be used as a means to promote responsible consumption through small behavioural and habit changes. Local and regional governments play a central role as the main drivers of awareness-raising campaigns.<sup>137</sup>

Demonstration of good practices in consumption can be shown across establishments and public spaces such as parks, gardens, and administrative buildings.

In addition, education will be a key lever to change consumption habits, especially in terms of waste and the type of product consumed.


Therefore, educational facilities such as schools and universities can be used for the dissemination of information, with the objective of informing citizens of the necessity and benefits of switching towards more sustainable food consumption.




#### [Bergamo—Fight against food waste, the “Rimpiattino” campaign—](#)

Food waste in restaurants is significant in Italy, as few customers ask to take away what is left on their plate. As a result, Ascom Confcommercio Bergamo, the Italian General Confederation of Enterprises, Professional Activities and Self-Employment launched a new campaign to tackle this problem. The Rimpiattino (the Italian doggy bag) campaign, gives out recyclable cardboard containers that allow customers to take food and drinks home from the restaurant. The containers are designed by well-known illustrators and artists. In the first pilot phase, 42 restaurants in the city and province of Bergamo joined the campaign.

### Impact potential

 **Environment:** In terms of environmental impact reduction, a more regenerative food chain in the Balearic Islands' tourism system would have clear benefits:

- **Emissions:** A circular food chain may also result in reduced GHG emissions from synthetic pesticides and fertilisers, less pollution from certain contaminants, and improved soil quality from more sustainable practices.
- **Resource recovery:** From a value chain perspective, it also helps minimise food waste, and ensures the recirculation of key nutrients back to the land, therefore mitigating nutrient depletion from the local soils.

 **Socioeconomic:** Incorporating these opportunities will bring significant benefits to the tourism system's various stakeholders.

- **Employment:** New job opportunities will arise in the development of innovative local agricultural production practices, but also in distribution processes and logistics.
- **Value creation:** At the same time, efforts to create a circular and regenerative food chain will also provide new sources of value, and new business opportunities to redistribute food surplus and capture the value of food waste to close the nutrient loop with agriculture.
- **Food resilience:** Most importantly, it will help strengthen and revalorise the local agricultural and food sectors, making them more competitive while reducing dependence on imports.

#### EXPECTED CHANGES FOR KEY INDICATORS:

- Decrease in total food consumption
- Increase in food production self-sufficiency rate
- Decrease in the use of synthetic fertilisers
- Increase in the share of agricultural land that is sustainable and regenerative
- Decrease in food waste
- Increase in the recovery rate food waste
- Improved biodiversity

### Terrestrial and marine environment

Spatial planning and management of the terrestrial and marine environment are essential mechanisms to start practically implementing solutions within the identified opportunities in the food sector.

- **Opportunity 1:** The development of regenerative agricultural practices will lead to protective measures for agricultural land, such as land use, fertiliser use and sustainable farming.
- **Opportunity 2:** The development of comprehensive food strategies can play a vital role in finding an optimal trade-off between farmers, fishermen and both on-shore and off-shore energy producers.

### Stakeholders

- **Balearic Islands administrations** will be crucial in promoting local and sustainable agricultural practices, particularly in the form of financial incentives and support. At the same time, administrations play a key role as 'promoters', and can lead by example by ensuring food procurement is circular, and that circular synergies and innovation in the food sector is facilitated.
- **Local farmers and food producers** will be at the heart of a circular and sustainable food chain for the tourism system. It's crucial that they are heard, and able to voice their concerns and challenges. In addition, they will be key implementers of circular and regenerative agricultural practices.
- **Academia and R&D** will have a role to play in providing technical expertise, disseminating knowledge and awareness and helping other stakeholders identify and map all possible synergies and opportunities, as well as highlighting the challenges and limitations of transitioning towards a circular food chain.
- **Financial institutions** will be key entities for other stakeholders to partner with, especially given the support that they can provide in making the transition economically viable. They may also reinvest in the local economy to make it more productive and resilient.
- **Food sector stakeholders and consumers** may contribute to the circular procurement of food products, shifting their consumption patterns and attempting to minimise food waste.



## MOBILITY | DRIVING FORWARD EFFICIENT, INTERCONNECTED AND SHARED MOBILITY

### Vision and description

Mobility is an essential service for the Balearic Islands' tourism system. However, the current mobility is predominantly based on the use and ownership of private vehicles with high dependence on fossil fuels—and consequently, high GHG emissions. In addition, private vehicles spend most of their functional lifetime unused: there's a clear opportunity to increase the efficiency of their use, decreasing mobility's environmental impact.

Transitioning towards a circular tourism system in the Balearic Islands should foster a reconfiguration of the transport network, increasing its efficiency while reducing polluting emissions and lengthening the lifetimes of mobility assets such as vehicles or infrastructure. A low-carbon, innovative and efficient mobility can be created in the region through close cooperation between local actors and investments from both the private and public sectors. In a circular mobility, both residents and tourists benefit from clean mobility options such as public transport, shared low-carbon mobility offerings and (e-)cycling.

### Opportunities

#### 1. Optimise the logistics for terrestrial mobility

Finding ways to optimise the flow of passengers and goods will help to minimise mileage, the total number of journeys and potentially the weight of cargo, therefore reducing emissions. Defining a territorial plan for freight transportation will be crucial to optimally and efficiently use the space and cargo capacity of logistics vehicles. Economic modelling can be used to plan for the optimisation of material flows entering the system,<sup>138</sup> and for the more efficient use of storage spaces for transportation and logistics hubs, connecting the arrival of freight and synchronising it with demand in the region. This modelling can be supported through the live monitoring of exchanges of goods across the tourism system by digitalising traffic flows.

Finally, decentralising logistics and distribution centres will further optimise the flow of goods throughout various parts of the tourism system. Platforms that promote the use of carbon-free and non-motorised transportation for last-mile-delivery in municipalities should be leveraged and supported.<sup>139</sup>



**Colibri—Shared logistic vehicles and cargo bicycles**—Colibri's decarbonised delivery service first uses one truck to carry a large number of parcels to a local mini distribution centre, also known as a mini-hub. The final distance to each parcel's delivery point is carried out by cargo bikes or small electric vehicles that are better adapted to the urban environment. This innovative shared logistics method also results in fewer trucks and heavy vehicles driving through neighbourhoods, leading to less traffic, congestion and pollution.

#### 2. Offer low-impact and shared mobility

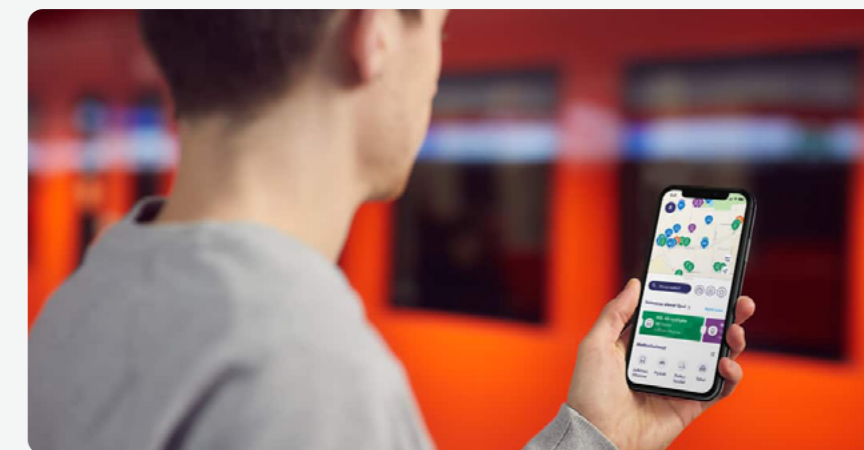
Governmental authorities have the opportunity to organise and promote shared mobility options.

Urban planning can also play a critical function, for instance in the development of networks of cycle lanes, pedestrian zones and low-emission zones in the central areas of towns and municipalities.

Flexible and adaptive public transport networks should be developed to accommodate seasons of high human pressure, through more optimal timetables and price incentives, for example. Investing in an online transport platform that integrates the different modes of transport in a single portal with timetables and possible routes may further incentivise consumers to use

public transport services. These measures have proven to be effective: Mallorca, for example, saw a 35.6% increase in public transport use after offering price incentives and better schedule information, as well as increasing the frequency of trips offered.<sup>140</sup>

Public authorities can also play a role in promoting and facilitating the supply of shared mobility services by financing and supporting new companies and business models related to car-sharing or bike-sharing, for example.



**Whim—Mobility-as-a-Service app**—Whim is a Mobility-as-a-Service (MaaS) app that aims to bring every kind of transport together into a single intuitive mobile app to offer travellers mobility solutions based on their travel needs. Born in Helsinki, the app offers everything from travel planning to payments, and presents itself as an alternative to private car ownership by combining different multiple mobility services. The concept of MaaS has now been adopted in many cities worldwide, as a digital service that takes a user-centric approach to mobility and tailors transportation services to the specific needs of their communities, regions and even entire countries.

**Impact potential**

**Environment:** In terms of environmental impact reduction, cleaner, more efficient and interconnected mobility in the Balearic Islands' tourism system would have clear benefits:

- **Resource efficiency:** Optimised freight and logistics services will allow multiple stakeholders to share freight machinery and equipment assets (such as vehicles, buildings), as well as technological resources and digital services—both boosting resource and efficiency.
- **Emissions:** Increasing vehicle occupancy will also mean that fewer vehicles can offer the same utility, reducing traffic and journey times, and consequently cutting GHG emissions. This is particularly important due to the terrestrial mobility sector's large impact: in 2019, it was responsible for 23% of total direct GHG emissions in the Balearic Islands.<sup>141</sup>



**Socioeconomic:** Incorporating these opportunities will bring significant benefits to the tourism system's various stakeholders.

- **Cost-savings:** In general, stakeholders will also benefit economically as shared services will reduce expenses on car insurance, taxes, parking permits and maintenance costs, lowering the overall costs of travelling.
- **Value creation:** Shared mobility opportunities also create value by stimulating start-ups and innovative business models: new forms of mobility provide an opportunity for new local companies to enter the market with novel technologies and solutions.

**EXPECTED CHANGES FOR KEY INDICATORS:**

- Decrease in GHG emissions associated with transport
- Decrease in the number of private vehicles
- Decrease in the number of vehicles per capita
- Increase in the use rate of public transport

**Terrestrial and marine environment**

Spatial planning and management of the Terrestrial and marine environments are essential mechanisms to practically implement solutions within the opportunities identified for the Mobility.

- **Opportunity 1:** A territorial plan for freight transportation within and between the islands is needed to optimise the efficient use of space and cargo capacity of logistics vehicles, and to decentralise logistics and distribution centres.
- **Opportunity 2:** Urban areas must be rethought for the development of a network of cycle lanes, pedestrian zones, and low emission zones, leading to an innovative and efficient mobility on the island.

**Stakeholders**

- **Balearic Islands administrations** should provide a clear vision and lead the way in defining new territorial and urban plans to optimise and decarbonise mobility in the tourism system. As observed, the government's department for terrestrial transport has a key role to play in incentivising the use of public services through financial and infrastructural incentives, and therefore should continue to utilise these instruments accordingly as the need for public transportation services grows. In particular, municipalities can make a relevant contribution developing sustainable urban mobility plans.
- **Logistics service providers, distribution companies and owners of storage facilities** can engage in the logistics planning for freight transportation, and especially contribute by making real-time data available to increase the traceability and transparency of freight transport. This can help make the entire network more efficient, flexible and adaptable.
- **Public transport operators:** An increase in the frequency and number of trips covered both between and within municipalities in the Balearic Islands will require significant investment in public transportation companies, in terms of the scale-up of machinery and equipment as well as the recruitment of qualified workers.
- **Private companies** working in the mobility sector (such as car rental companies) will play a key role as drivers of innovation and to satisfy the demand for alternative and low-carbon mobility solutions in the tourism system, for instance by prioritising the procurement of electric vehicles, or providing novel business models for shared mobility.
- **Mobility users**, such as citizens and visitors, will have a key role in choosing clean mobility options and advocating for their widespread availability and usage.

>  
THE WAY  
FORWARD



A circular tourism system provides the Balearic Islands with an opportunity to increase their sustainable global competitiveness and boost long-term prosperity. However, there are key aspects to consider to ensure an effective circular transition in the region:

- **Systemic change:** In transitioning to a circular tourism system, policy instruments and the development of best practices for business and industry will be crucial. Circular principles must be integrated in territorial planning, to ensure that regulation and public and private investments are effective and can contribute to necessary infrastructure and foster circular business models.
- **Collaboration and coordination amongst stakeholders:** The transition needs to take an integrated approach that ensures the creation of a circular economy network, involving diverse stakeholders: the public sector, local SMEs and multinationals, academia, and civil society. Working together to define and plan next steps and actions on the ground will be essential to take advantage of the benefits of a circular tourism system, both with top-down policymaking and bottom-up processes and initiatives.
- **Governance of the transition:** In order to ensure an effective collaboration among stakeholders, governance is key. In addition to the important role of the government via top-down policy instruments, it must also define the actors that will be part of the transition towards a circular tourism system and create clusters or networks that integrate them, serving as a platform for discussion and knowledge exchange.
- **Development of knowledge and skills:** Technological and innovation clusters around key topics can be an important driver for the transition to a circular tourism system, led by local businesses and research institutions, positioning the region at the forefront of circularity in the Mediterranean. Education and the development of new skills will play an important role in existing and new activities related to services, resource management and repair. The region can leverage the role of the University of the Balearic Islands (UIB) and professional education to build local capacity around circularity.

- **Monitoring and measurement of the transition:** Both research<sup>142</sup> and practice<sup>143</sup> show that a systematic data-driven approach is crucial in driving the circular transition of the Balearic Islands' tourism system. This report suggests an approach to measure the principal inflows and outflows of each of the key focus areas to provide an overview of the current state of the tourism system. However, to make meaningful progress when implementing circular opportunities, public and private actors of the tourism system should also put in place measurement frameworks to:
  - Set ambitious targets to orient circular action;
  - Monitor the progress of the transition in terms of key resources flows and impacts over time.

To this end, efforts should be prioritised to increase the availability of data on an increasing number of relevant indicators for each of the key focus areas. This can be done by expanding statistical databases and creating new household and industry surveys through the tourism supply chain and support activities and services. At the same time, a clear connection should be made between the tourism system's circular economy targets and its broader sustainability objectives of the region, highlighting the impacts that circular interventions in the tourism system could have in terms of economic, social and environmental prosperity.

While the Balearic Islands' tourism system exhibits consumption patterns that are currently not aligned with the vision of long-term prosperity and resilience depicted in this report, it is well-positioned to take on the challenge of going circular. With a variety of initiatives happening on the ground, and the alignment of policy targets with national and EU agendas, the tourism system has great potential to drive this change forward and to pursue a new vision for the future development of Balearic Islands. Proactive stakeholder engagement will be key to the transition's success—and with the engagement shown by the tourism system's key stakeholders across the private sector, public entities and academia, the foundations are laid for the circular transition to succeed.

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**Publication date:**

March 2023

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